

# TABLE OF CONTENTS

---

<b>Section 1</b>	<b>Introduction.....</b>	<b>1-1</b>
<b>Section 2</b>	<b>Purpose of and Need for Action.....</b>	<b>2-1</b>
<b>Section 3</b>	<b>Alternative Analysis .....</b>	<b>3-1</b>
3.1	Alternative 1: No Action.....	3-1
3.2	Alternative 2: Proposed Action.....	3-1
3.2.1	Tilden Regional Park (Figure 4).....	3-1
3.2.2	Claremont Canyon Regional Preserve (Figure 5).....	3-3
3.2.3	Sibley Volcanic Regional Preserve (Figures 6 and 7).....	3-4
3.2.4	Huckleberry Regional Preserve (Figure 7).....	3-5
3.2.5	Redwood Regional Park (Figures 8 and 9).....	3-6
3.2.6	Anthony Chabot Regional Park (Figures 9, 10, and 11).....	3-7
3.2.7	Leona Heights Regional Open Space (Figure 12).....	3-8
3.3	Alternative 3: Modified Methods Alternative.....	3-9
3.4	Summary of Impacts and Mitigation.....	3-9
<b>Section 4</b>	<b>Affected Environment, Impacts, and Mitigation.....</b>	<b>4-1</b>
4.1	Biological Resources.....	4-1
4.1.1	Vegetation and Wildlife.....	4-1
4.1.2	Special-Status Species .....	4-5
4.1.3	Claremont Canyon Regional Preserve .....	4-6
4.1.4	Alternative 1: No Action.....	4-10
4.1.5	Alternative 2: Proposed Action.....	4-11
4.1.6	Alternative 3: Modified Methods.....	4-18
4.2	Geology, Seismicity, and Soils .....	4-18
4.2.1	Geology.....	4-18
4.2.2	Seismicity.....	4-20
4.2.3	Soils .....	4-21
4.2.4	Alternative 1: No Action.....	4-22
4.2.5	Alternative 2: Proposed Action.....	4-22
4.2.6	Alternative 3: Modified Methods.....	4-22
4.3	Water Resources .....	4-23
4.3.1	Hydrology and Water Quality.....	4-23
4.3.2	Executive Order 11988: Floodplain Management.....	4-26
4.3.3	Executive Order 11990: Protection of Wetlands .....	4-27
4.4	Air Quality .....	4-28
4.4.1	Alternative 1: No Action.....	4-28
4.4.2	Alternative 2: Proposed Action.....	4-28
4.4.3	Alternative 3: Modified Methods.....	4-29
4.5	Cultural Resources .....	4-29
4.5.1	Alternative 1: No Action.....	4-29

# TABLE OF CONTENTS

---

	4.5.2	Alternative 2: Proposed Action.....	4-29
	4.5.3	Alternative 3: Modified Methods.....	4-30
4.6		Visual Resources.....	4-30
	4.6.1	Visual Character and Quality of the Project Area.....	4-30
	4.6.2	Viewsheds and the Sensitivity of the Project Area.....	4-31
	4.6.3	Alternative 1: No Action.....	4-31
	4.6.4	Alternative 2: Proposed Action.....	4-32
	4.6.5	Alternative 3: Modified Methods.....	4-34
4.7		Socioeconomics and Safety .....	4-34
	4.7.1	Executive Order 12898: Environmental Justice .....	4-34
	4.7.2	Property Values.....	4-36
	4.7.3	Public Safety .....	4-37
4.8		Public Services.....	4-38
	4.8.1	Alternative 1: No Action.....	4-38
	4.8.2	Alternative 2: Proposed Action.....	4-38
	4.8.3	Alternative 3: Modified Methods.....	4-39
4.9		Cumulative Impacts .....	4-39
<b>Section 5</b>		<b>Public Participation and Agency Coordination.....</b>	<b>5-1</b>
<b>Section 6</b>		<b>List of Preparers .....</b>	<b>6-1</b>
<b>Section 7</b>		<b>References .....</b>	<b>7-1</b>
<b>Tables</b>			
1		Summary of Impacts and Mitigation.....	3-10
2		Plant Species Observed at Project Sites in Claremont Canyon on January 8, 2003 .....	4-7
3		Relative Landslide Susceptibility of Geologic Units in the East Bay Regional Park District.....	4-19
4		Major Seismic Sources Near the East Bay Regional Park District Sites .....	4-21
5		Comparison of Environmental Justice Indicators .....	4-35
<b>Figures</b>			
1		Vicinity Map	
2		1991 East Bay Hills Fire	
3		Project Areas Map Index	
4		Tilden Regional Park Vegetation Communities	

# TABLE OF CONTENTS

---

5	Claremont Canyon Regional Preserve Vegetation Communities
6	Sibley Volcanic Regional Preserve (West) Vegetation Communities
7	Sibley Volcanic Regional Preserve (West) and Huckleberry Regional Preserve Vegetation Communities
8	Redwood Regional Park (Northwest) Vegetation Communities
9	Redwood Regional Park (Southwest) and Anthony Chabot Regional Park Vegetation Communities
10	Anthony Chabot Regional Park (East) Vegetation Communities
11	Anthony Chabot Regional Park (West) Vegetation Communities
12	Leona Heights Regional Open Space Vegetation Communities
13	Tilden Regional Park Special-Status Species Occurrences
14	Claremont Canyon Regional Preserve Special-Status Species Occurrences
15	Sibley Volcanic Regional Preserve (West) Special-status Species Occurrences
16	Sibley Volcanic Regional Preserve (West) and Huckleberry Regional Preserve Special-Status Species Occurrences
17	Redwood Regional Park (Northwest) Special-Status Species Occurrences
18	Redwood Regional Park (Southwest) and Anthony Chabot Regional Park Special-Status Species Occurrences
19	Anthony Chabot Regional Park (East) Special-Status Species Occurrences
20	Anthony Chabot Regional Park (West) Special-Status Species Occurrences
21	Leona Heights Regional Open Space Special-Status Species Occurrences

## Appendices

A	Description of the Disaster (Excerpt from <i>Hazard Mitigation Report for the East Bay Fire in the Oakland-Berkeley Hills</i> [FEMA et al. 1992])
B	Wildland Hazards and Mitigation Programs (Excerpt from <i>Fire Hazard Mitigation Program and Fuel Management Plan for the East Bay Hills</i> [Amphion Environmental 1995])
C	Treatment Prescription Descriptions by Vegetation Type
D	Prescribed Fire Plan Development Guidelines
E	U.S. Fish and Wildlife Service Biological Opinion

# TABLE OF CONTENTS

---

F	Special-Status Species That Potentially Occur in the Project Areas or Project Vicinity
G	Agreement with U.S. Fish and Wildlife Service Terms and Conditions by East Bay Regional Park District
H	Background Research on Prescribed Fire
I	Specific Use Guidelines, Label, and MSDS for Garlon 4 and Pathfinder II Herbicides in East Bay Regional Park District Fuel Management Zones
J	Response Letter from the State Historic Preservation Officer
K	Visual Resource Analysis
L	List of Interested Parties
M	Public Comments on Draft Environmental Assessment

# TABLE OF CONTENTS

---

## Acronyms

ATBM	all-terrain brushing machine
BAAQMD	Bay Area Air Quality Management District
BO	Biological Opinion and Incidental Take Statement
BMP	Best Management Practice
CalEPPC	California Exotic Pest Plant Council
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EA	Environmental Assessment
EO	Executive Order
FEMA	Federal Emergency Management Agency
HEF	Hills Emergency Forum
HMGP	Hazard Mitigation Grant Program
Hills	East Bay Hills
LBNL	Lawrence Berkeley National Laboratory
MSDS	Material Safety Data Sheet
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO <sub>2</sub>	nitrogen dioxide
O <sub>3</sub>	ozone
PM <sub>10</sub>	particulate matter less than 10 micrometers in diameter
psi	pounds per square inch
SHPO	State Historic Preservation Officer

# TABLE OF CONTENTS

---

SO <sub>2</sub>	sulfur dioxide
SOD	Sudden Oak Death
UC	University of California
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMC	East Bay Hills Vegetation Management Consortium
VOC	volatile organic compound

The East Bay Regional Park District (EBRPD) has applied for assistance from the Federal Emergency Management Agency (FEMA) Region IX Hazard Mitigation Grant Program (HMGP) #919-515-24 under Presidential Disaster Declaration FEMA-919-DR-CA. This Environmental Assessment (EA) has been prepared according to the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality's regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and FEMA's implementing regulations (44 CFR Part 10).

EBRPD has recognized the need for a fire-safe environment in several parks situated in the East Bay Hills of Alameda and Contra Costa Counties, California (Figure 1). Between 1923 and 1995, 14 major wildfires occurred in the East Bay Hills (the Hills). These fires burned over 11,000 acres, destroyed over 3,500 structures, and caused 26 fatalities. The 1991 East Bay Hills Fire caused more loss of homes than any other California wildfire (Figure 2). The combination of hot, dry summers, high elevations, flammable nonnative species, urban development, limited fire-fighting access, and Diablo winds can create a substantial fire danger in the Hills. In addition to park property, properties potentially affected by wildfires in the Hills include residences and businesses in Alameda and Contra Costa Counties, the Lawrence Berkeley National Laboratory (LBNL), and the University of California (UC), Berkeley.

The Hills surrounding Berkeley, Oakland, and San Leandro have sustained 14 major wildfires since 1923, including the 1991 East Bay Hills Fire, which destroyed over 2,700 structures and caused over \$1 billion in damages, including over \$70 million in FEMA disaster expenditures. Appendix A contains a detailed description of the 1991 East Bay Hills Fire, including meteorological data and a map showing the extent of the fire (FEMA et al. 1992).

Following this disaster, the East Bay Hills Emergency Forum (HEF), consisting of the California Department of Forestry and Fire Protection (CDF), the City of Oakland, the City of Berkeley, the City of El Cerrito, EBRPD, the East Bay Municipal Utility District (EBMUD), LBNL, and UC Berkeley was formed to coordinate emergency planning among fire agencies and land management agencies and to develop a new fire hazard mitigation program and plan for the Hills. The plan, which utilizes up-to-date fire science concepts, sets forth a unified approach for public agencies and homeowners to follow in reducing the considerable fire risks still present in residential areas in the Hills and the adjacent wildlands. An excerpt of the plan describing the rationale and methodology for the approach to wildland hazards and mitigation is included in Appendix B (Amphion Environmental 1995).

As a result of these investigations and in an effort to prevent a recurrence of the 1991 East Bay Hills Fire, EBRPD has identified the need to create a more fire-safe environment in several parks situated in the Hills. All of these parks are in the vicinity of the 1991 East Bay Hills Fire and were identified in the HEF's plan as high hazard areas.

The predominance of high-ignition-potential vegetation, such as senescent Monterey pines (*Pinus radiata*), Tasmanian blue gums (*Eucalyptus globulus*), red gums (*Eucalyptus camaldulensis*), French broom (*Genista monspessulanus*), and nonnative annual grasses, forbs, and shrubs within the project sites represent a significant fire danger to adjacent property owners. The fire hazard in this area is compounded by limited access for fire-fighting personnel due to narrow streets and the absence of accessible staging areas. Potentially affected property owners include residents and businesses of the Hills, the LBNL, UC Berkeley, EBMUD, and EBRPD.

The project purpose is to reduce the threat of property damage, personal injury, and other impacts to public health and safety caused by future fires in the Hills. Action is required to create a defensible space and safe fire-fighting access routes to better protect the urban/wildland interface.

### **3.1 ALTERNATIVE 1: NO ACTION**

Under this alternative, vegetation management activities would not occur on EBRPD property within the Hills. In absence of these activities, exotic, high-ignition-potential vegetation would not be removed, and the existing high-fire hazard would continue.

### **3.2 ALTERNATIVE 2: PROPOSED ACTION**

Under this alternative, EBRPD would conduct vegetation management on 36 sites within 7 regional parks (Tilden Regional Park, Claremont Canyon Regional Preserve, Sibley Volcanic Regional Preserve, Huckleberry Regional Preserve, Redwood Regional Park, Anthony Chabot Regional Park, and Leona Heights Regional Open Space). The 36 project sites are depicted on Figures 3 through 12. Most of the proposed vegetation management activities would be implemented within smaller action areas within the project sites, so the actual acreage affected would be less than the total acreage of the sites. Types of vegetation management proposed for these sites include hand labor, tree removal, mechanical treatments, prescribed burning, grazing, and chemical treatments. Most of the vegetation activities focus on removing nonnative species, such as eucalyptus, Monterey pine, French broom, and acacia. Some native shrubs, such as coyote bush, would also be removed or reduced in height prior to prescribed burning.

Detailed descriptions of each method of vegetation management, including equipment requirements, application methods, timing, and maintenance procedures, are provided in Appendix C. Before implementing prescribed burns, EBRPD would develop a prescribed fire plan for each of the prescribed burn sites as outlined in Appendix D. The burn plans would be coordinated with appropriate regulatory agencies, and would be consistent with guidelines imposed by the U.S. Fish and Wildlife Service (USFWS) for the protection of special-status species. The Proposed Action Alternative would be implemented over a 3-year period. The following sections describe activities that are proposed for each project site.

#### **3.2.1 Tilden Regional Park (Figure 4)**

##### **3.2.1.1 Site 101: Remove Eucalyptus Trees Along South Side of Canon Drive**

EBRPD proposes to remove mature blue gum eucalyptus trees, which are growing amid mature oak and bay trees on 1.8 acres along the south side of Canon Drive. EBRPD would use a professional tree service with a crane. This activity would be followed by hand application of Garlon™ 4 (Garlon 4), an herbicide, on the cut stumps. Tree removal is scheduled during the first year of implementation, while application of Garlon 4 would occur once or twice annually during the second and third years of the project.

##### **3.2.1.2 Site 102: Remove Eucalyptus Trees and Reduce Volume of French Broom on North Side of Canon Drive**

EBRPD proposes to remove eucalyptus trees and reduce brush volume of French broom on 4 acres on the north side of Canon Drive. EBRPD would use hand labor for vegetation removal,

which is scheduled to occur over 3 years. Garlon 4 would be applied to eucalyptus stumps once or twice annually by hand crews.

**3.2.1.3 Site 103: Remove Mature/Aging Monterey Pines Overhanging Wildcat Canyon Road**

EBRPD would remove mature or aging Monterey pine trees overhanging Wildcat Canyon Road using a professional tree service with a crane. Work is proposed to occur during the first year of project implementation.

**3.2.1.4 Site 104: Remove Remaining Pines and Eucalyptus Trees in Fuel Break on Both Sides of Shasta Road**

EBRPD proposes to remove Monterey pines and blue gum eucalyptus trees on 8.5 acres in the Shasta Road area of Tilden Regional Park. Trees would be removed using conventional logging or other means. Hand crews would follow up eucalyptus tree removals with application of Garlon 4 once or twice in the year after tree removal.

**3.2.1.5 Site 105: Remove Eucalyptus Sprouts South of Tilden Golf Course**

EBRPD plans to remove blue gum eucalyptus sprouts on the 18 acres between Tilden Golf Course and the ridgeline on the west side of Tilden Regional Park. Sprouts would be removed using a masticator (or similar mechanical grinder) or another tree removal method that has minimum impact on the remaining native vegetation. Sprout removals would be followed by hand application of Garlon 4 to cut stumps once or twice in the year after sprout removal.

**3.2.1.6 Site 106: Remove Scattered Eucalyptus Re-sprouts and Pines and Thin Brush Along Frowning Ridge Fuel Break**

Using conventional logging or other tree removal techniques, EBRPD would remove the remaining eucalyptus re-sprouts and pines on 2.0 acres along Frowning Ridge. Hand labor would be used to thin brush at this site. These activities are proposed for the first year of project implementation. During the second and third years of project implementation, Garlon 4 would be reapplied to cut eucalyptus stumps once or twice annually by hand crews.

**3.2.1.7 Site 108: Remove French Broom in Fuel Break Between Wildcat Canyon Road and Central Park Drive**

EBRPD would use hand labor over 2 years to remove French broom throughout this 14-acre fuel break by uprooting.

**3.2.1.8 Site 109: Remove French Broom in Lake Anza Fuel Break**

EBRPD proposes to remove French broom throughout this 16-acre fuel break. This activity would be accomplished over 1 year using hand labor to uproot the broom.

**3.2.1.9 Site 110: Remove French Broom in Fuel Break Between Lake Anza and Tilden Golf Course**

EBRPD would use hand labor to remove French broom throughout this 5-acre fuel break by uprooting over a 2-year period.

**3.2.1.10 Activity 111: Garlon 4 Application on Eucalyptus Sprouts (Fuel Breaks)**

Eucalyptus stump re-sprouts would be treated with Garlon 4 over a 2-year period throughout a 150 acre area (including Activity 111 and Activity 309) of managed eucalyptus groves to maintain fuel breaks.

**3.2.2 Claremont Canyon Regional Preserve (Figure 5)**

In addition to activities described below for sites at Claremont Canyon, 17.5 acres of the Claremont Canyon Regional Preserve would be utilized for Alameda whipsnake research (see Section 4.1.5.3). Shrubs would be mechanically treated with an all-terrain brushing machine (ATBM) and then receive a prescribed burn between mid November and mid March. The ATBM is a multipurpose track-mounted machine that has capabilities to fell trees, cut brush, and mulch with a ground pressure of between 3 and 5.5 pounds per square inch (psi) depending on the size of the model deployed (typical bulldozers exert ground pressure of approximately 7 psi).

**3.2.2.1 Site 201: Expand Grasslands on Ridge and South-Facing Slopes to Connect with Native Low-Risk Vegetation**

EBRPD proposes to decrease and divide the brushland areas on this 6.5-acre site between Claremont Creek and Panoramic Ridge by expanding grasslands areas. Mechanical or manual (hand crew) methods would be used to remove brush on this project site. Where possible, brush would be removed to connect grasslands with low-fire-risk vegetation types (e.g., oak-bay forest or riparian).

**3.2.2.2 Site 202: Remove French Broom in Fuel Break along Panoramic Ridge**

EBRPD proposes to remove French broom throughout this 0.4-acre fuel break area along Panoramic Ridge. This activity would be accomplished over a 2-year period using hand labor.

**3.2.2.3 Site 203: Reduce Eucalyptus Slash and Remove French Broom at Stonewall Gate**

EBRPD proposes to remove 7.1 acres of eucalyptus understory fuels, including French broom and small-diameter eucalyptus trees, in an area adjacent to a residential neighborhood over the 3-year project period. Hand labor would be used to remove French broom and small-diameter eucalyptus trees. Any tree removed would be followed with hand application of Garlon 4 to cut eucalyptus stumps. French broom and eucalyptus slash and litter would be piled and burned.

**3.2.2.4 Site 251: Use Prescribed Fire in Claremont Canyon and Panoramic Ridge**

EBRPD proposes to use prescribed fire on approximately 40 acres of flammable materials, including grasslands and brushlands. The project would be carried out over the 3-year project period. Initially, control lines would be hand-constructed along the perimeter of this site. The prescribed fire would be applied in sections to create a brushland/grassland mosaic after brush height is reduced by mechanical or manual (hand crew) labor.

**3.2.2.5 Site 252: Use Prescribed Fire in Claremont Canyon and Gwin Canyon**

EBRPD proposes to use prescribed fire on approximately 40 acres of flammable materials, including grasslands, brushlands (after brush height is reduced by mechanical or manual [hand crew] labor), and eucalyptus slash. This activity would be conducted over the 3-year project period.

**3.2.3 Sibley Volcanic Regional Preserve (Figures 6 and 7)****3.2.3.1 Site 301: Remove Eucalyptus Trees in Sibley Triangle South of Skyline Boulevard**

EBRPD proposes to remove blue gum eucalyptus trees on 9.3 acres in Sibley Volcanic Regional Preserve, south of Skyline Boulevard and west of Thorndale Drive and Elverton Drive. Trees would be removed using conventional logging techniques. Hand crews would follow up eucalyptus removals with the application of Garlon 4 to cut stumps. This area would be cleared over a 1-year period.

**3.2.3.2 Site 302: Remove Eucalyptus Trees in Fuel Break on Lower Canyon East of Sibley Volcanic Regional Preserve Staging Area**

EBRPD proposes to remove red gum eucalyptus trees using a horse logger or other tree removal method from 8.9 acres in the canyon southeast of the Sibley Volcanic Regional Preserve staging area. The clearing would be conducted over a 1-year period. Hand crews would follow up eucalyptus tree removal with application of Garlon 4 to cut stumps.

**3.2.3.3 Site 304: Remove Eucalyptus Trees in Sibley Island Fuel Break**

EBRPD proposes to remove the remaining blue gum eucalyptus trees on the ridgeline between Skyline Boulevard and Grizzly Peak Boulevard over a 2-year period. Trees would be removed from 4.5 acres using a conventional logging contractor, professional tree service, or other mechanical means. The slash would be piled for subsequent burning. Hand crews would follow up eucalyptus tree removal with application of Garlon 4 to cut stumps.

**3.2.3.4 Site 305: Remove Selected Pines in Sibley Island Fuel Break**

EBRPD proposes to remove selected Monterey pines from 1.5 acres on the ridgeline between Skyline and Grizzly Peak Boulevards. Trees would be removed during the first year of the project

using a conventional logging contractor, professional tree service, or other mechanical means. The slash would be piled for subsequent burning.

### **3.2.3.5 Site 306: Thin or Remove Eucalyptus Trees on East Side of Grizzly Peak Boulevard**

EBRPD proposes to remove mature blue gum eucalyptus trees from 2.1 acres on the east side of Grizzly Peak Boulevard using conventional logging or other means. Hand crews would follow up eucalyptus tree removal with application of Garlon 4 to the cut stumps. The slash would be piled for subsequent burning.

### **3.2.3.6 Site 308: Clear Brush in Canyon East of Thorndale and Elverton Drives (Sibley Triangle)**

EBRPD proposes to clear 7.7 acres of brush from the canyon east of Thorndale and Elverton Drives and adjacent to new housing areas. Hand labor would be used over a 1-year period to cut the brush, which would be piled for subsequent burning.

### **3.2.3.7 Activity 309: Garlon 4 Application on Eucalyptus Sprouts (Fuel Breaks)**

Eucalyptus stump re-sprouts would be treated with Garlon 4 over a 2-year period throughout a 150 acre (including Activity 309 and Activity 111) of managed eucalyptus groves to maintain fuel breaks.

### **3.2.3.8 Site 351: Use Prescribed Fire East of Sibley Volcanic Regional Preserve Staging Area**

EBRPD proposes to use prescribed fire on approximately 7.2 acres of grass and brushland with eucalyptus slash. Hand crews would construct control lines along the perimeter of this site before applying a prescription burn.

## **3.2.4 Huckleberry Regional Preserve (Figure 7)**

### **3.2.4.1 Site 401: Remove Eucalyptus Trees in Fuel Break near Huckleberry Regional Preserve Staging Area**

EBRPD proposes to use a professional tree service to remove eucalyptus trees from 0.1 acre east of the Huckleberry Regional Preserve staging area (parking lot). These trees are in a saddle on the ridgeline that, if ignited in an east-wind situation, could send embers into the Thornhill area of Oakland. Hand crews would follow up eucalyptus tree removal with application of Garlon 4 to the cut stumps.

**3.2.4.2 Site 402: Remove Eucalyptus Trees in Fuel Break near Pinehurst Road–Skyline Boulevard Intersection**

EBRPD proposes to use a professional tree service or other mechanical means to remove eucalyptus trees from 0.15 acre near the Pinehurst Road–Skyline Boulevard intersection. These trees are in a saddle on the ridgeline that, if ignited in an east-wind situation, could send embers into the residential Shepherd Canyon area of Oakland. Hand crews would follow up eucalyptus tree removal with application of Garlon 4 to the cut stumps.

**3.2.5 Redwood Regional Park (Figures 8 and 9)****3.2.5.1 Site 501: Remove Eucalyptus Trees in Fuel Break at Pinehurst Road–Skyline Boulevard Intersection**

EBRPD proposes to use a professional tree service or logging contractor to remove eucalyptus trees from 0.15 acre southeast of the Pinehurst Road–Skyline Boulevard intersection between Huckleberry Regional Preserve and Redwood Regional Park. These trees are in the middle of a saddle on the ridge that, if ignited in an east-wind situation, could send embers into the residential Shepherd Canyon area of Oakland. Hand crews would follow up eucalyptus tree removal with application of Garlon 4 to the cut stumps.

**3.2.5.2 Site 502: Remove Pines, Acacias, and Selected Cypress in Serpentine Prairie**

EBRPD proposes to use a professional tree service or other mechanical method to remove pines, acacias (*Acacia* spp.), and selected cypress (*Cupressus macrocarpa*) from 0.2 acre in the serpentine section of Redwood Regional Park. See USFWS Biological Opinion, Appendix E, for a detailed description of protective measures.

**3.2.5.3 Site 503: Remove Brush, Eucalyptus Trees, Pine Saplings, and Old Pines in Fuel Break North of East Ridge Trail**

EBRPD proposes to widen the East Ridge fuel break to the EBMUD boundary with Redwood Regional Park by removing brush, red gum eucalyptus trees, and Monterey pine seedlings. A professional tree service would be contracted to remove over-mature Monterey pines in the fuel break. Hand crews would be employed to cut brush, eucalyptus trees, and pine saplings. Cut material would be piled and burned or scattered and left in place, depending on the volume. Hand crews would follow up eucalyptus tree removal with application of Garlon 4 to the cut stumps. This activity would be conducted throughout the 3-year project period.

**3.2.5.4 Site 551: Use Prescribed Fire or Hand Removal of Brush and Exotics in Serpentine Prairie**

EBRPD proposes to remove brush, exotic plants, and flammable hazardous fuels on approximately 20 acres of grasslands and brushlands using prescribed fire or hand removal techniques. If prescribed fire is used, control lines would be hand-constructed along the perimeter

of this site. See USFWS Biological Opinion, Appendix E, for a detailed description of protective measures.

### **3.2.5.5 Site 552: Use Prescribed Fire at Skyline Gate and East Ridge Trail**

EBRPD proposes to use prescribed fire on approximately 30 acres of grasslands in a stand of pine and eucalyptus trees. Control lines would be hand-constructed along the perimeter of this site. Debris from pine and eucalyptus trees would be piled and the prescription fire would be conducted to reduce these flammable fuels.

### **3.2.6 Anthony Chabot Regional Park (Figures 9, 10, and 11)**

In addition to the activities described below, 62.1 acres of the Anthony Chabot Regional Park would be utilized for an Alameda whipsnake research project (see Section 4.1.5.3). Shrubs would be mechanically treated with an all-terrain brushing machine (ATBM) and then receive a prescribed burn between mid November and mid March. The ATBM is a multipurpose track-mounted machine that has capabilities to fell trees, cut brush, and mulch with a ground pressure of between 3 and 5.5 pounds per square inch (psi) depending on the size of the model deployed (typical bulldozers exert ground pressure of approximately 7 psi).

#### **3.2.6.1 Site 603: Fence Brushfields South and North of the “Natural Dam”**

EBRPD proposes to install fencing to extend existing cattle grazing areas northward to include areas south and north of the “natural dam” at the end of Parkridge Drive. On completion, the 80-acre fenced area would be managed as grasslands.

#### **3.2.6.2 Site 604: Clear Brush in Parkridge Fuel Break**

EBRPD proposes to reduce 4.0 acres of brush fuels along the residential boundary in the Parkridge Estates area above Anthony Chabot Regional Park. Hand labor would be used to cut the brush, which would be piled for removal or burning, or scattered on the site. These activities would occur throughout the 3-year project period.

#### **3.2.6.3 Site 605: Clear Brush and Pines in Fuel Break from City Stables to City Line Reservoir**

EBRPD proposes to reduce a total of 1.0 acre of brush and pine fuels along the residential boundary between City Stables and City Line Reservoir. Hand labor would be used to cut brush and trees, which would be piled and burned.

#### **3.2.6.4 Site 606: Clear Brush for New Fuel Break above Skyline Ranch**

EBRPD proposes to create a new fuel break along the residential boundary above Skyline Ranch. To create the fuel break, hand crews would remove French broom and cut coyote bush (*Baccharis pilularis*) and other shrubs. This 0.70-acre site would be cleared, and the vegetation

within 120 feet of the horse barn would be modified. This activity is expected to occur over a 2-year period. Cut material would be scattered as mulch or piled for burning.

### **3.2.6.5 Site 610: Thin or Remove Eucalyptus Trees in Designated Fuel Break Areas**

EBRPD proposes to cut and remove red gum eucalyptus trees from selected areas over a 2-year period. Eighty acres of eucalyptus stands would be thinned or, if funding is sufficient, removed using conventional logging or other mechanical means to reduce the vegetation fuel load. Eucalyptus stump re-sprouts would be treated with Garlon 4 over a 2-year period throughout this area of managed eucalyptus groves to maintain fuel breaks.

### **3.2.6.6 Site 610, Activity 608: Pile Slash in Eucalyptus Fuel Break**

Eucalyptus slash from Site 610 would be hand-piled in the first year of project implementation and allowed to dry out. During the following year, slash piles would be disassembled and repiled for burning in 8-by-8-foot piles spaced not less than 20 feet from each other and no more than 100 feet apart. This method of burning would decrease potential for inadvertent burning of Alameda whipsnakes that take refuge in the piles.

### **3.2.6.7 Site 610, Activity 609: Clear Debris and Spread Slash in Fuel Breaks**

Small leftover slash pieces from Site 610 that are not piled will be chipped and spread evenly throughout the site. This activity will take place over a 2-year period beginning in the first year of project application.

### **3.2.6.8 Site 652: Use Prescribed Fire in Grass Valley**

EBRPD proposes to conduct prescribed burns on 45 acres of eucalyptus slash remaining from a logging contract. Prior to the burn, control lines would be hand-constructed along the perimeter of this site. Slash piles would be disassembled and repiled for burning in 8-by-8-foot piles spaced not less than 20 feet from each other and no more than 100 feet apart. This method of burning would decrease potential for inadvertent burning of Alameda whipsnakes that take refuge in the piles.

## **3.2.7 Leona Heights Regional Open Space (Figure 12)**

### **3.2.7.1 Site 701: Cut and Pile Brush along Leona Heights Regional Open Space Boundary near Residences**

EBRPD proposes to create a 100-foot-wide fuel break along the Leona Heights Regional Open Space boundary near residences. Hand labor would reduce or remove brush and fire-hazardous vegetation from 20 acres over a 2-year period.

**3.2.7.2 Site 751: Use Prescribed Fire at Leona-Sugar Loaf Area**

To reduce flammable fuels at Leona-Sugar Loaf Area, EBRPD proposes to use prescribed fire on approximately 40 acres of grasslands and brushlands. Prior to the burn, control lines would be hand-constructed along the perimeter of this site.

**3.3 ALTERNATIVE 3: MODIFIED METHODS ALTERNATIVE**

Under this alternative, EBRPD would employ alternate treatments to those described for the Proposed Action Alternative, where alternate treatments are feasible. In all cases, vegetation targeted and acres treated would be the same under Alternative 3 as under the Proposed Action Alternative. Alternative 3 would also be implemented over a 3-year period.

Horse logging would occur at Sites 104, 105, 106, 302, and 304 to remove eucalyptus trees under Alternative 3. For Site 104, horse logging would also be used to remove Monterey pines. At Sites 101, 102, 104, 105, 106, 301, 302, 304, and 306, EBRPD would conduct sucker bashing (removal of shoots below the treatment point) three times per year throughout the 3-year project.

Under Alternative 3, goats would be grazed at Sites 308, 603, and 701 to reduce fuels, and hand labor would be implemented at Site 252 to remove vegetation.

**3.4 SUMMARY OF IMPACTS AND MITIGATION**

Table 1 summarizes the impacts and mitigation measures associated with each alternative.

**Table 1  
Summary of Impacts and Mitigation**

<b>Resource Area</b>	<b>No Action</b>	<b>Proposed Action</b>	<b>Modified Methods Alternative</b>
<b>Description of Alternative</b>			
	No implementation of fuel reduction or vegetation management projects.	Selective removal of Monterey pines, red gum Eucalyptus trees, Tasmania blue gum Eucalyptus trees, and exotic understory; minor road improvements to fire trails; and creation of staging areas.	At select sites, horse logging, sucker bashing, and goat grazing would be used as alternatives to treatments described for the Proposed Action.
<b>Potential Impacts</b>			
Biological Resources	Vegetation and wildlife remain subject to future fires.	Impacts to vegetation, wildlife, and special-status species mitigated by pre-construction surveys, timing, and/or avoidance measures, best management practices, and post-treatment monitoring, maintenance, and revegetation.	Impacts to vegetation, wildlife, and special-status species mitigated by pre-construction surveys, timing, and/or avoidance measures, best management practices, and post-treatment monitoring, maintenance, and revegetation.
Geology, Seismicity, and Soils	Soil loss, erosion, and potential landslides caused by unstable soils following loss of vegetation.	Soil loss, erosion, compaction, and potential landslides mitigated by erosion control measures.	Soil loss, erosion, compaction, and potential landslides mitigated by erosion control measures.
Water Resources	Water quality and wetlands potentially impacted by erosion and fire residue; no impacts to floodplains.	Water quality and wetland impacts mitigated by avoidance and erosion control measures; no impacts to floodplains.	Water quality and wetland impacts mitigated by avoidance and erosion control measures; no impacts to floodplains.
Air Quality	Potential emissions from wildfires.	Potential impacts mitigated by coordination with local regulatory agencies.	Impacts would be similar to, but slightly less than, those of the Proposed Action.
Cultural Resources	Potential impacts from wildfires.	Potential impacts mitigated by instructing crews and ceasing work if cultural resources are discovered.	Potential impacts mitigated by instructing crews and ceasing work if cultural resources are discovered.
Visual Resources	Potential impacts from wildfires.	Impacts would be negligible or temporary.	Impacts would be negligible or temporary.
Socioeconomics and Safety	Potential impacts from wildfires.	Potential impacts would be negligible or mitigated by coordination with local regulatory agencies.	Potential impacts mitigated by coordination with local regulatory agencies.
Public Services	Potential impacts from wildfires.	Potential impacts mitigated by using signs and temporarily rerouting visitors away from project sites.	Impacts would be similar to, but slightly more than, those of the Proposed Action.

None of the proposed project alternatives are expected to result in substantial adverse impacts to the environment. Therefore, the analysis in this section focuses on those resource areas where some level of impact may result, including biological resources; geology, seismicity, and soils; water resources; air quality; cultural resources; visual resources; socioeconomics and safety; and public services. No other resource areas were identified as requiring further evaluation pursuant to NEPA.

## **4.1 BIOLOGICAL RESOURCES**

### **4.1.1 Vegetation and Wildlife**

The proposed project areas include the following vegetation communities: Grasslands, North Coastal Scrub (wet and dry), Successional Scrub, Mixed Hardwood Woodland and Forest, Eucalyptus Forest (1- to 5-year, 20-year, and mature), Monterey Pine Forest (mature stands and plantations), Mixed Mature Monterey Pine/Eucalyptus Forest, Riparian Forest, Cypress Forest, and Redwood/Douglas Fir Forest. All of these vegetation communities have the potential to be impacted by vegetation management activities except for Riparian Forest and Redwood/Douglas Fir Forest, which are uncommon in the project areas. Figures 3 through 12 illustrate the vegetation communities at the proposed project sites.

The project areas encompass a total of approximately 831 acres. The vegetation community that accounts for the most acreage in the project areas is Eucalyptus Forest (298 acres, or 36 percent of the total acreage). The majority of the Eucalyptus Forest community is in the 20-year Eucalyptus Forest (second growth) subcategory (281 acres). The North Coastal Scrub (wet and dry) accounts for the second largest acreage in the project areas (270 acres, or 32 percent of total acreage). There are 72 acres of Mixed Hardwood Woodland and Forest, accounting for 9 percent of the project areas. The Grasslands community, which is dominated by nonnative annual grasses but includes native grasses and herbs, also accounts for 9 percent of the total project areas (78 acres). The nonnative Monterey Pine Forests, Mixed Mature Monterey Pine/Eucalyptus, and Cypress Forest communities account for 9 percent of the total acreage (71 acres). The native Redwood/Douglas Fir Forest, Riparian Forest, and Successional Scrub communities account for 4 percent of the total acreage (31 acres). There are also 11 acres of developed land.

Vegetation was mapped for the Hills and is described in *Fire Hazard Mitigation Program and Fuel Management Plan for the East Bay Hills* (Amphion 1995; Appendix B), which was prepared for the East Bay Hills Vegetation Management Consortium (VMC). The following sections describe the vegetation communities within the project sites. These descriptions were summarized from *Fire Hazard Mitigation Program and Fuel Management Plan for the East Bay Hills* and “Treatment Prescription Descriptions by Vegetation Type” (Appendix C) and include some species observed in the vegetation communities during the URS site visit to Claremont Canyon on January 8, 2003.

#### **4.1.1.1 Grasslands**

Grasslands in the project areas primarily consist of nonnative annual grasses. Common nonnative annual grasses in the Hills include wild oats (*Avena* spp.), rip gut brome (*Bromus diandrus*), soft

chess (*Bromus hordeaceus*), and foxtail barley (*Hordeum murinum* ssp. *leporinum*). The following nonnative plants listed as occurring in the Hills grasslands in *Vegetation Management Almanac for the East Bay Hills* (Danielsen et al. 2001) are on the California Exotic Pest Plant Council (CalEPPC) A-1 list of most invasive wildland pests in California: yellow star-thistle (*Centaurea solstitialis*), artichoke thistle (*Cynara cardunculus*), pampas grass (*Cortaderia jubata*), fennel (*Foeniculum vulgare*), French broom, and Himalayan blackberry (*Rubus discolor*) (CalEPPC 1999).

Although nonnative grasses dominate this vegetation community, some remnants of native grasslands can be found, such as California brome (*Bromus carinatus*), California oat grass (*Danthonia californica*), blue wildrye (*Elymus glaucus*), purple needlegrass (*Nassella pulchra*), and pine bluegrass (*Poa secunda*) (Danielsen et al. 2001). Some native forbs in the grasslands are yarrow (*Achillea millefolium*), California poppy (*Eschscholzia californica*), and blue-eyed grass (*Sisyrinchium bellum*). Although grassland fires, especially those with a low cover of shrubs, tend to be lower intensity fires than in other vegetation types, grasslands can ignite easily and fire can spread rapidly. Grassland fires can act as a vector to ignite other vegetation communities.

Shrubs that sporadically occur in the project area grasslands include coyote bush (*Baccharis pilularis*) and French broom. French broom is an invasive and highly flammable species that occurs in mixed stands with many vegetation communities, including Grasslands, North Coastal Scrub, and along the interface with developed areas. French broom occurs throughout many of the project sites in large stands. Although French broom can offer limited foraging habitat for passerines and some reptiles, it is not critical for any special-status species. French broom can be a serious wildfire problem once ignited and may increase losses of native shrubs and woodlands in its proximity.

Wildlife species that are known to utilize Grasslands of the Hills include black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), sharp-tailed snake (*Contia tenuis*), Western skink (*Eumeces skiltonianus*), Southern alligator lizard (*Gerrhonotus multicarinatus*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), and white-crowned sparrow (*Zonotrichia leucophrys*) (Danielsen et al. 2001).

#### 4.1.1.2 North Coastal Scrub

North Coastal Scrub (soft chaparral) in the project areas consists of wet north coastal scrub on mesic slopes and dry coastal scrub on xeric slopes. Native shrubs, which vary from approximately 2 to 8 feet tall, dominate this community. Dominant shrubs include coyote bush (*Baccharis pilularis*), California sagebrush (*Artemisia californica*), ceanothus (*Ceanothus* sp.), sticky monkeyflower (*Mimulus aurantiacus*), California blackberry (*Rubus ursinus*), Himalayan blackberry, poison oak (*Toxicodendron diversilobum*), huckleberry (*Vaccinium ovatum*), and French broom. Other associated species in the understory of the north coastal scrub in the Hills are nonnative annual grasses and bracken fern (*Pteridium aquilinum*). Coyote bush and poison oak are aggressive native plants that can dominate areas of north coastal scrub and displace other native plants in the absence of control measures (Danielsen et al. 2001). Although north coastal scrub is more difficult to ignite than grasslands, north coastal scrub is more difficult to suppress once it is ignited because it burns at a higher intensity due to the density of fuel loads and the volatile oils in some of the vegetation.

Mammals common to the North Coastal Scrub community include black-tailed deer, gray fox, bobcat, brush rabbit (*Sylvilagus bachmani*), and striped skunk (*Mephitis mephitis*). Bird species that occur in this habitat include California quail (*Callipepla californica*), California towhee (*Pipilo crissalis*), spotted towhee (*Pipilo maculatus*), song sparrow (*Melospiza melodia*), and Western scrub jay (*Apelocoma californica*). Reptiles in this community include the Northwestern fence lizard (*Sceloporus occidentalis occidentalis*), western skink, and northern Pacific rattlesnake (*Crotalus viridis oregonus*).

#### **4.1.1.3 Successional Scrub**

This vegetation community is a natural successional stage between the North Coastal Scrub community and the Mixed Hardwood Woodland and Forest community. This community consists of a mix of trees and shrubs, with a tree cover that varies but is usually less than 30 percent. Dominant species include California bay, scrub oak (*Quercus berberidifolia*), coast live oak, nonnative annual grasses, blackberry (*Rubus* spp.), coyote bush, ceanothus, huckleberry, sticky monkeyflower, poison oak, and California sagebrush. Scrub species found in this community include blue elderberry (*Sambucus mexicana*), currants (*Ribes* sp.), and toyon (*Heteromeles arbutifolia*). The fire hazard of this vegetation type varies depending on its successional stage. Some areas have a dense understory of shrubs that is difficult to suppress once it is ignited because it burns rapidly and hotter due to the density and the volatile oils in some of the vegetation. In addition, successional scrub consists of trees that could ignite and start a crown fire.

Successional scrub has the potential to support species that occur in the North Coastal Scrub and the Mixed Hardwood Woodland and Forest communities.

#### **4.1.1.4 Mixed Hardwood Woodland and Forest**

The Mixed Hardwood Woodland and Forest vegetation community consists of a mix of trees that reach approximately 30 to 50 feet in height, including coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), Pacific madrone (*Arbutus menziesii*), and California buckeye (*Aesculus californica*). Mixed Hardwood Woodlands have a shrub understory with a 30 percent to 70 percent cover and include many of the shrubs in the Successional Scrub community, such as blue elderberry, currants, and toyon. Other species include coyote bush, sticky monkeyflower, California blackberry, poison oak, and fennel. Mixed Hardwood Forests have greater than 70 percent canopy closure and have a sparse understory. In general, a mixed hardwood forest is less of a fire hazard than a mixed hardwood woodland due to relatively less surface and ladder fuels. The dense understory of the woodland type has the potential to create a hot fire that could ignite the trees (crown fires).

Wildlife species that are known to use the Mixed Hardwood Woodland and Forest community in the Hills include slender salamander (*Batrachoseps attenuatus*), great horned owl (*Bubo virginianus*), sharp-tailed snake, Northern oriole (*Icterus bullockii*), California brown bat (*Myotis californicus*), woodrat (*Neotoma fuscipes*), California newt (*Taricha torosa*), and orange-crowned warbler (*Vermivora celata*) (Danielsen et al. 2001).

**4.1.1.5 Eucalyptus Forest**

Eucalyptus trees were introduced from Australia in the early 1900s and widely planted within the project areas. Eucalyptus Forest communities in the project areas consist of mature Eucalyptus Forest, 20-year Eucalyptus Forest, and 1- to 5-year Eucalyptus Forest. Blue gum eucalyptus is the dominant tree in most stands, but some areas also have red gum eucalyptus. Mature Eucalyptus Forest communities are stands that have never been harvested. These stands typically have a sparse understory primarily with young eucalyptus trees, poison oak, annual nonnative grasses, and Monterey pines and acacia on the edges. Twenty-year Eucalyptus Forest stands are second-growth trees that were harvested in the last 20 years for firewood or removed because of freeze damage. One- to 5-year Eucalyptus Forest communities have trees that were cut in the last 1 to 5 years and have re-sprouted. Both 20-year Eucalyptus Forest and 1- to 5-year Eucalyptus Forest have mixed understories, with native coast live oak and California bay, nonnative Monterey pine and acacia, and nonnative shrubs.

The rapid growth and reproduction of eucalyptus trees have led to a complete dominance and loss of native vegetation and wildlife habitat within many of the sites proposed for vegetation management. In addition to the density of these stands, most native vegetation within the understory cannot withstand the shading and thick leaf litter produced by eucalyptus trees. Eucalyptus trees can be a serious wildfire problem once ignited due to their high oil content and the potential for crown fires.

Mature eucalyptus trees (well-branched trees with a diameter at breast height of greater than 20 inches) support nesting birds, including common raptors (e.g., red-tailed, Cooper's, and red-shouldered hawks [*Buteo jamaicensis*, *Accipiter cooperii*, and *B. lineatus*]), great-horned owls, and passerines (e.g., finches [*Carpodacus* sp.], blackbirds [*Agelaius* sp.], and doves [*Columbina* sp.]). Eucalyptus flowers are visited by nectivorous and insectivorous birds (e.g., hummingbirds [*Calypte* sp.], cedar waxwings [*Bombycilla cedrorum*], and yellow-rumped warblers [*Dendroica coronata*]) and are often used by butterflies as bivouac sites.

**4.1.1.6 Monterey Pine Forest**

Stands of Monterey pine, which is native to California but not local to the Hills, were planted within the project areas in the early 1900s and occur as mature groves and as dense plantations. Typical understory vegetation in these areas includes nonnative annual grasses, young Monterey pines, poison oak, blackberry, coast live oaks, and California bay trees. Edges are sometimes mixed with French broom and acacia. Monterey pine forests have a high potential for ignition when needles and other debris accumulate in the understory, and Monterey pines have volatile resin that causes them to burn rapidly if ignited. Branch die-off caused by the Ips beetle (*Ips* spp.) also increases fire hazards. Cutting Monterey pines when Ips beetles are active (from March until October) can spread the disease (Danielsen et al. 2001).

Monterey pines offer nesting and limited foraging habitat for birds, including passerines and raptors.

**4.1.1.7 Mixed Mature Monterey Pine/Eucalyptus Forest**

This vegetation community is primarily a mix of eucalyptus trees and Monterey pines and therefore has similar species and fire hazards as the Monterey Pine Forest and the Eucalyptus Forest in the Hills.

**4.1.2 Special-Status Species**

A list of federally endangered and threatened species, and species proposed for threatened or endangered status, with the potential to be located in the project areas was obtained from the USFWS on April 7, 1999. In addition, an EBRPD district-wide inventory of park resources was prepared that included federally listed species and other special-status species (June 1, 1998). According to these inventories, the following federally listed species may be found within the proposed project areas:

- **Alameda whipsnake.** Alameda whipsnake (*Masticophis lateralis euryxanthus*), a federally threatened species, has been observed in the project area.
- **Presidio clarkia.** The federally endangered plant Presidio clarkia (*Clarkia franciscana*) is known to occur at Sites 502 and 551.
- **Santa Cruz tarplant.** EBRPD determined that the federally listed Santa Cruz tarplant (*Holocarpha macradenia*) may be present in the project areas after a review of its database of known sightings of protected species and habitat surveys. Santa Cruz tarplant is known to occur in Wildcat Canyon, located north of the project areas.
- **Pallid manzanita.** Pallid manzanita (*Arctostaphylos pallida*) is known to occur at Tilden Regional Park in or near Sites 101, 103, and 110; at Huckleberry Regional Preserve in or near Site 402; at Sibley Volcanic Regional Preserve in or near Sites 302 and 351; and at Redwood Regional Park.
- **Callippe silverspot butterfly.** USFWS identified the Callippe silverspot butterfly (*Speyeria callippe callippe*) as having the potential to occur in the project areas. Historically, this butterfly occurred in the project vicinity, but it is believed to be extirpated from this area (CNDDDB 2002).

Appendix F provides a complete listing of all special-status species (including nonfederally listed species) and their potential to occur in the project areas or project vicinity. This list was compiled from the USFWS and EBRPD listings as well as queries of the CNDDDB (2002) and the California Native Plant Society databases (CNPS 2003). The project vicinity is defined as any area within the seven EBRPD parks included in this project and the area within a 1-mile radius of each proposed project site. The database searches covered the Oakland West, Oakland East, San Leandro, Richmond, Las Trampas Ridge, Briones Valley, and Hayward U.S. Geological Survey (USGS) 7.5-minute quadrangles. The potential for a species to occur in the project areas or project vicinity is based on the presence of suitable habitat for that species and/or historic occurrences in the CNDDDB, USFWS, CNPS, and EBRPD databases.

Figures 13 through 21 illustrate the proposed project sites and special-status species occurrences since 1980 as mapped by CNDDDB (plants and wildlife) and EBRPD (plants only) (CNDDDB

2002). The figures graphically represent special-status species occurrences that fall within a project site, EBRPD special-status plant occurrences located within a 200-foot radius of a project site, and EBRPD occurrences of Presidio clarkia located within a 500-foot radius of a project site.

The following descriptions provide details on special vegetation communities or vegetation communities with high potential to support special-status species:

- **Serpentine bunchgrass** is a rare native community that is mapped by the CNDDDB in the project area at the Skyline Serpentine Prairie at Redwood Regional Park (Sites 502 and 551) and Anthony Chabot Regional Park (Site 606) (CNDDDB 2002). Because California serpentine soils are low in calcium, overly rich in magnesium, and high in toxic metals, some native plants that can tolerate these conditions are able to successfully colonize serpentine grasslands and out-compete less tolerant nonnative species. As a result, serpentine grasslands usually have a higher diversity of native plants than annual nonnative grasslands and support unusual serpentine endemic native plants. Native grasses at the serpentine grassland in the project area include Torrey's melicgrass (*Melica torreyana*), pine bluegrass, and purple needlegrass (CNDDDB 2002). Presidio clarkia (*Clarkia franciscana*), a federally endangered plant, also occurs in the serpentine grassland at Sites 502 and 551. The Skyline Serpentine Prairie also provides habitat for known occurrences of several other special-status plants: Diablo helianthella (*Helianthella castanea*), round-leaved filaree (*Erodium macrophyllum*), and robust monardella (*Monardella villosa* ssp. *globosa*) (CNDDDB 2002).
- **North Coastal Scrub.** This vegetation community has the potential to support a high occurrence of special-status plants, including pallid manzanita (*Arctostaphylos pallida*), Oakland star tulip (*Calochortus umbellatus*), Presidio clarkia (*Clarkia franciscana*), Western leatherwood (*Dirca occidentalis*), Diablo helianthella, and Tiburon buckwheat (*Eriogonum luteolum* var. *caninum*). In addition, the North Coastal Scrub community is the core habitat type of the threatened Alameda whipsnake. Although whipsnakes are found in a variety of other habitats (excluding eucalyptus and closed canopy forests), the snakes are more likely to use north coastal scrub because they can find consistent forage (primarily lizards) and cover.
- **Mixed Hardwood Woodland and Forest.** This vegetation community may also support special-status species. The federally threatened Alameda whipsnake may occur in woodlands adjacent to North Coastal Scrub communities. Sharp-shinned hawk (*Accipiter striatus*) has been observed in project areas (Danielsen et al. 2001). Special-status plants that occur in this habitat are Oakland star tulip, Diablo helianthella, balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*), and western leatherwood.

#### 4.1.3 Claremont Canyon Regional Preserve

Due to public concerns raised during the public comment period on the Draft Environmental Assessment regarding the proposed vegetation management activities in Claremont Canyon Regional Preserve, a detailed description of this park and its proposed project sites (201, 202, 203, 251, and 252) has been added to the Final Environmental Assessment. Figure 5 shows the proposed project sites and vegetation communities within Claremont Canyon Regional Preserve.

The 205-acre Claremont Canyon Regional Preserve is bordered by the UC Clark Kerr campus to the west and the UC ecological preserve to the north and east. Claremont Creek runs through the park, and there are no developed facilities. Claremont Canyon is one of the largest undeveloped canyons in the Hills. This canyon burned in the 1991 East Bay Hills Fire. After the 1991 fire, the Claremont Canyon Conservancy, a community-based nonprofit organization, was formed to reduce fire hazards, improve public access, and provide for annual maintenance in the canyon by developing a long-term stewardship plan.

Claremont Canyon previously supported more extensive grasslands than are currently present in the area. The canyon was grazed by cattle prior to the 1950s, which helped to maintain grasslands. The lack of grazing and fire suppression in the Hills has contributed to the conversion of grasslands to dense shrublands, including dense stands of coyote bush (Edwards 1992; McBride and Heady 1968). Figure 5 shows that Claremont Canyon currently has little grassland relative to North Coastal Scrub. In addition to dense coyote bush stands, Claremont Canyon also supports flammable exotic vegetation such as French broom, eucalyptus trees, and Monterey pines, creating a fire hazard that threatens the adjacent residential areas.

The proposed Claremont Canyon project sites, 201, 202, 203, 251, and 252, were visited on January 8, 2003, by URS biologists to collect more detailed information on the habitats. North Coastal Scrub is the dominant vegetation community in the Claremont Canyon project sites. Other vegetation communities in the sites include Mixed Hardwood Forest, Grasslands, and mature Eucalyptus Forest. Table 2 lists the plants observed within the project sites on January 8, 2003.

**Table 2  
Plant Species Observed at Project Sites in Claremont Canyon on January 8, 2003**

Scientific Name	Common Name	Native or Nonnative	Site 201	Site 202	Site 203	Site 251	Site 252
<b>Grasslands</b>							
---	nonnative annual grasses	nonnative	X	X	X	X	
<i>Achillea millefolium</i>	yarrow	native		X			
<i>Carduus pycnocephalus</i>	Italian thistle	nonnative			X		
<i>Chlorogalum pomeridianum</i>	soap plant	native		X	X		
<i>Cynosurus echinatus</i>	hedgehog dogtail	nonnative		X			
<i>Ehrharta erecta</i>	Stebbin's grass	nonnative		X			
<i>Elymus glaucus</i>	blue wildrye	native		X			
<i>Eriogonum</i> sp.	buckwheat	native	X	X	X	X	
<i>Eschscholzia californica</i>	California poppy	native	X	X		X	
<i>Foeniculum vulgare</i>	fennel	nonnative		X			
<i>Genista monspessulana</i>	French broom	nonnative		X			
<i>Geranium</i> sp.	geranium	native or nonnative		X	X		
<i>Hirschfeldia incana</i>	short pod mustard	nonnative	X	X	X	X	
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail	nonnative		X			
<i>Hypochaeris radicata</i>	rough cat's ear	nonnative	X	X		X	

**Table 2**  
**Plant Species Observed at Project Sites in Claremont Canyon on January 8, 2003**

Scientific Name	Common Name	Native or Nonnative	Site 201	Site 202	Site 203	Site 251	Site 252
<i>Oxalis pes-caprae</i>	Bermuda buttercup	nonnative			X		
<i>Pinus radiata</i>	Monterey pine	nonnative (nonlocal)		X			
<i>Plantago lanceolata</i>	English plantain	nonnative			X		
<i>Silybum marianum</i>	milk thistle	nonnative		X			
<b>North Coastal Scrub</b>							
---	nonnative annual grasses	nonnative	X			X	X
<i>Arbutus menziesii</i>	Pacific madrone	native					X
<i>Artemisia californica</i>	California sagebrush	native	X			X	
<i>Artemisia douglasiana</i>	mugwort	native					X
<i>Baccharis pilularis</i>	coyote bush	native	X			X	X
<i>Bromus hordeaceus</i>	soft chess	nonnative					X
<i>Cirsium vulgare</i>	bull thistle	nonnative					X
<i>Chlorogalum pomeridianum</i>	soap plant	native					X
<i>Conium maculatum</i>	poison hemlock	nonnative					X
<i>Cyperus eragrostis</i>	tall flat sedge	native					X
<i>Elymus glaucus</i>	blue wildrye	native					X
<i>Eucalyptus globulus</i>	blue gum eucalyptus	nonnative					X
<i>Genista monspessulana</i>	French broom	nonnative	X			X	X
<i>Heteromeles arbutifolia</i>	toyon	native					X
<i>Hirschfeldia incana</i>	short pod mustard	nonnative	X			X	
<i>Juncus</i> sp.	rush	native or nonnative					X
<i>Marrubium vulgare</i>	horehound	nonnative	X			X	X
<i>Mimulus aurantiacus</i>	sticky monkeyflower	native	X			X	X
<i>Pinus radiata</i>	Monterey pine	nonnative (nonlocal)	X			X	X
<i>Pteridium aquilinum</i>	bracken fern	native					X
<i>Quercus agrifolia</i>	coast live oak	native	X			X	X
<i>Rhamnus californica</i>	coffeeberry	native					X
<i>Ribes</i> sp.	gooseberry	native					X
<i>Rubus ursinus</i>	California blackberry	native					X
<i>Sambucus meixcana</i>	blue elderberry	native					X
<i>Satureja douglasii</i>	yerba buena	native					X
<i>Salix lasiolepis</i>	arroyo willow	native					X
<i>Toxicodendron diversilobum</i>	poison oak	native	X			X	X
<i>Umbellularia californica</i>	California bay	native	X			X	X
<b>Mixed Hardwood Forest</b>							
---	nonnative annual grasses	nonnative			X		X
<i>Aesculus californica</i>	California buckeye	native					X
<i>Baccharis pilularis</i>	coyote bush	native					X
<i>Eucalyptus globulus</i>	blue gum eucalyptus	nonnative			X		X

**Table 2  
Plant Species Observed at Project Sites in Claremont Canyon on January 8, 2003**

Scientific Name	Common Name	Native or Nonnative	Site 201	Site 202	Site 203	Site 251	Site 252
<i>Foeniculum vulgare</i>	fennel	nonnative					X
<i>Genista monspessulana</i>	French broom	nonnative			X		
<i>Heteromeles arbutifolia</i>	toyon	native			X		
<i>Hirschfeldia incana</i>	short pod mustard	nonnative					X
<i>Lonicera hispidula</i> var. <i>vacillans</i>	vine honeysuckle	native			X		
<i>Mimulus aurantiacus</i>	sticky monkeyflower	native			X		
<i>Oxalis pes-caprae</i>	Bermuda buttercup	nonnative			X		
<i>Pinus radiata</i>	Monterey pine	nonnative					X
<i>Polystichum munitum</i>	sword fern	native			X		X
<i>Quercus agrifolia</i>	coast live oak	native			X		X
<i>Rubus ursinus</i>	California blackberry	native			X		X
<i>Toxicodendron diversilobum</i>	poison oak	native			X		
<i>Umbellularia californica</i>	California bay	native			X		X
<b>Mature Eucalyptus Forest</b>							
---	nonnative annual grasses	nonnative			X		
<i>Contoneaster</i> sp.	contoneaster	nonnative			X		
<i>Eucalyptus globulus</i>	blue gum eucalyptus	nonnative			X		
<i>Ehrharta erecta</i>	Stebbin's grass	nonnative			X		
<i>Genista monspessulana</i>	French broom	nonnative			X		
<i>Heteromeles arbutifolia</i>	toyon	native			X		
<i>Mimulus aurantiacus</i>	sticky monkeyflower	native					
<i>Oxalis pes-caprae</i>	Bermuda buttercup	nonnative			X		
<i>Plantago lanceolata</i>	English plantain	nonnative			X		
<i>Quercus agrifolia</i>	coast live oak	native			X		
<i>Sambucus mexicana</i>	blue elderberry	native			X		
<i>Umbellularia californica</i>	California bay	native			X		

**Site 201.** Site 201 consists of North Coastal Scrub (dry) and Grasslands. Both communities are on steep and primarily south-facing slopes. The North Coastal Scrub community was dominated by a dense cover of coyote bush of approximately 80 to 85 percent. Sporadic California bay and coast live oak saplings are present in the shrub layer. The understory, which is more developed between openings in the shrub layer, is dominated by young annual nonnative grasses. Similarly, the understory of the Grasslands community at this site is dominated by young annual nonnative grasses. Two native species observed in the grasslands were California poppy and buckwheat (*Eriogonum* sp.). Grasslands in the surrounding area are currently sparse relative to other habitats.

**Site 202.** Site 202 is a relatively narrow band of grasslands adjacent to the unpaved trail on Panoramic Ridge. This area contains a dense cover of French broom (approximately 70 to 80

percent cover) and fennel (approximately 5 to 10 percent cover) that tends to be denser immediately adjacent to the unpaved trail. Young annual nonnative grasses were observed in the understory as well as native California poppy, buckwheat, yarrow, and soap plant (*Chlorogalum pomeridianum*).

**Site 203.** Site 203 supports Grasslands, Mixed Hardwood Forest, and mature Eucalyptus Forest communities. Mature Eucalyptus Forest (blue gum eucalyptus) is the dominant community on this site. The canopy closure of approximately 50 to 60 percent supports a sparse understory, which primarily consists of nonnatives such as young blue gum, contoneaster (*Contoneaster* sp.), French broom, and Bermuda buttercup (*Oxalis pes-caprae*). Grasslands were found on a steep west-facing slope and include native buckwheat (*Eriogonum* sp.) and soap plant. On the steep north-facing slope is a Mixed Hardwood Forest community that has a canopy closure of approximately 60 percent. The dominant trees are coast live oak and blue gum eucalyptus. The understory layer is sparse but includes native sticky monkeyflower, California blackberry, vine honeysuckle (*Lonicera hispidula* var. *vacillans*), and sword fern (*Polystichum munitum*).

**Site 251.** Site 251 is primarily North Coastal Scrub and Grasslands. Site 251 is on a steep south-facing slope, and the vegetation is similar to that of Site 201, with a dense cover of coyote bush of approximately 80 to 85 percent and an understory dominated by young annual nonnative grasses.

**Site 252.** Site 252 is in Gwin Canyon and consists primarily of a North Coastal Scrub (dry) community on a steep west-facing slope. There is a section of Mixed Hardwood Forest community towards the bottom of the canyon on a steep northwest-facing slope. North coastal scrub at this site contains a dense cover of coyote bush (approximately 70 percent cover). Other shrubs observed included French broom, sticky monkeyflower, poison oak, coffeeberry (*Rhamnus californica*), gooseberry (*Ribes* sp.), and blue elderberry. Blue wildrye (*Elymus glaucus*), a native grass, was also observed at this site. The understory is composed of nonnative grasses and occasionally California blackberry.

#### **4.1.4 Alternative 1: No Action**

##### **4.1.4.1 Vegetation and Wildlife**

Under the No Action Alternative, EBRPD would not conduct vegetation management activities within its parks in the Hills. Wildlife and their habitats in and around the project areas could be adversely affected should a wildfire occur. Native plant and wildlife species would not benefit from the selective reduction of nonnative vegetation.

##### **4.1.4.2 Special-Status Species**

The No Action Alternative would not conduct vegetation management activities and would therefore not directly impact proposed or listed threatened and endangered species in the project areas. However, the potential for losses to special-status species due to wildfire would remain. Uncontrolled wildfires have the potential to burn at a greater intensity than a prescribed fire.

Therefore, future uncontrolled wildfires could result in adverse impacts to proposed or listed threatened and endangered species through the loss of habitat and/or the mortality of individuals.

#### **4.1.5 Alternative 2: Proposed Action**

The Proposed Action Alternative would potentially affect vegetation, wildlife, and special status species. In general, the potential impacts to vegetation include mortality, reproductive failure, enhanced reproduction, spread and establishment of native plants or nonnative plants, spread of diseases, vegetation type-conversion, improved biodiversity, and diversification of vegetation types. Short-term, indirect impacts to wildlife as a result of the Proposed Action Alternative are projected to occur. Direct impacts in the form of individual mortality, morbidity, and reproductive failure to mollusks (snails and slugs), annelids (worms), arthropods (insects), and miscellaneous small vertebrates could be expected as a result of proposed actions. The specific impacts associated with each proposed activity (prescribed fire, logging and mechanical treatments, chemical treatments, and grazing) are summarized below.

To avoid or minimize these impacts, management activities would be implemented according to well-defined, site-specific plans and the activities would be followed up with maintenance, monitoring, and revegetation. These specific activities are also described below. With implementation of these measures, the project is expected to have a beneficial effect on native vegetation and wildlife by reducing the risk of stand-replacing catastrophic wildfires and improving the quality of habitat.

Appendix C contains descriptions by vegetation community of the EBRPD vegetation management activities that would be implemented in the Hills. These activities would be refined for each site. During the development of site-specific vegetation management plans, the public would have the opportunity to provide input at EBRPD's environmental roundtable meetings.

##### **4.1.5.1 Vegetation and Wildlife**

###### **4.1.5.1.1 Prescribed Fire**

Prescribed fire is proposed as part of Alternative 2 to reduce fuel loads on Sites 251, 252, 351, 551, 552, 652, and 751 (as well as an area in Anthony Chabot Regional Park that would be burned as the part of the Alameda whipsnake research project). Detailed site-specific prescriptions would be developed for each project site; Appendix D describes the prescribed fire plan guidelines. Each site-specific prescribed fire plan would be reviewed by EBRPD's multi-disciplinary Prescribed Fire Working Group, which includes a Wildlife Biologist and Range Management Specialist. The prescribed fire plan for Site 551 would also be submitted to USFWS for review and approval. Prescribed fire would be implemented in nonnative annual Grasslands and/or North Coastal Scrub communities at all of these sites except for Site 652, where eucalyptus slash would be burned. Some hand-piling and burning of excess French broom slash may also be conducted at this site.

In north coastal scrub, prescribed fire would be conducted to reduce the dense cover of shrubs and the high fuel loads from accumulated debris. Prescription fires would be phased on some sites to extend over the 3-year performance period for this project. Shrub height would be

reduced using an ATBM prior to broadcast-burning to reduce fire intensity. EBRPD may reburn these sites as ongoing maintenance, depending on the results of each individual prescribed burn.

Within the Grasslands vegetation community, prescribed fire is proposed as a management tool to reduce fuel loads and prevent the establishment of shrubs, with the goal of maintaining a cover of less than approximately 30 percent. EBRPD would broadcast-burn flammable materials within Grasslands vegetation communities. EBRPD may reburn these sites as ongoing maintenance, depending on the results of each individual prescribed fire. Such frequent low-intensity fires in annual grasslands are expected to effectively reduce fuel loads and prevent shrub establishment.

The use of prescription fire would create a mosaic of vegetation communities at various successional stages, which would enhance wildlife habitat. Such small burns would create openings in vegetation that benefit wildlife movement corridors and improve the nutritious quality of available forage. Some wildlife would be attracted to newly burned areas.

Appendix H contains a summary of background research regarding the effects of prescribed burns on vegetation and wildlife. Research supports the conclusion that prescribed burns effectively reduce fuel loads, prevent shrub establishment in grasslands, and benefit native plants and some wildlife species.

#### **4.1.5.1.2 Logging and Mechanical Treatments**

Vegetation management activities to thin eucalyptus trees, Monterey pines, and acacia would require the use of heavy equipment to access, cut, and remove the trees. Hand-removal of French broom and other shrubs would require equipment such as chainsaws, handsaws, brush cutters, and weed eaters. Hand labor would also be utilized to remove small-diameter eucalyptus trees and to sucker bash sprouts that grow after initial thinning activities. Excess slash of Monterey pines would be chipped and left on site. These mechanical and manual actions could impact vegetation through accidental crushing, breaking, uprooting, trampling, soil compaction, or otherwise damaging the plants.

Heavy equipment could cause soil erosion or soil compaction, especially if work is scheduled for the rainy season. Soil compaction greater than approximately 80 percent could prevent the growth of vegetation. Excessive soil compaction could also destroy the mycorrhizal fungi that native plants rely on for establishment and growth.

The long-term impacts to vegetation and wildlife of the proposed removal of exotic, high-fire-hazard vegetation and the encouragement of lower-fire-hazard native species would be beneficial. Most of the pines that would be removed are mature and dying; if left in place, they would increase the fire hazard of the project areas by the addition of dry timber and dead needles. Further, many of the project sites contain dense canopies of eucalyptus trees or pines that shade out native species, thereby diminishing species diversity. Opening the canopy and removing competitive, exotic species would aid in reestablishing native species in these areas. Eucalyptus species produce a heavy litter layer of woody debris that inhibits understory vegetation and reduces wildlife habitat. Removing the thick litter layer would allow herbaceous understory vegetation to become reestablished, thereby providing cover and forage areas for avian and small mammal populations. These areas would be monitored to maintain a cover of aggressive nonnatives of less than 20 percent.

There is a potential to spread disease when thinning eucalyptus trees and Monterey pines. The spread of disease can increase fire hazards. Cutting eucalyptus trees infested with eucalyptus longhorn borer can spread the disease if it is cut when the borer is active (from March until October) (Danielsen et al. 2001). Cutting Monterey pines when Ips beetles are active (from March until October) can spread disease as well (Danielsen et al. 2001). Another potential impact associated with removing shrubs or trees is the spread of *Phytophthora ramorum*, the water mold that causes sudden oak death (SOD). EBRPD would ensure that maintenance crews are educated on the characteristic symptoms of this disease. Crews would report its potential presence to supervisors and suspicious material would be submitted for testing. If SOD is confirmed in a project site, the BMPs outlined by the California Oak Mortality Task Force (at [www.suddenoakdeath.org](http://www.suddenoakdeath.org)) would be implemented to prevent its spread. These efforts would aid in the further detection of potentially new infected sites and/or help minimize the spread of this pathogen through normal monitoring and maintenance activities.

Prior to the removal of any large trees that could support nesting raptors, EBRPD would ensure that a qualified biologist surveys each tree for signs of nests. If any nests are located, the tree would be retained and a 100-foot buffer zone would be established around the tree's perimeter. All nests would be allowed to proceed through fledgling and dispersal of young before logging activity commences; however, trees supporting nests of sensitive species would remain permanently undisturbed unless the tree represents an immediate threat to public safety. A qualified biologist would also survey large trees for colonial nesting birds (i.e., herons or egrets) that may have established rookeries in trees within the fuel break sites. All rookeries would remain permanently undisturbed and protected by a designated 100-foot buffer zone around the perimeter of the tree; however, if the tree represents an immediate threat to public safety, then it would be removed. All hand-clearing of brush would avoid appropriate avian nesting seasons, as determined by the type of bird/nest to be protected.

#### **4.1.5.1.3 Chemical Treatments**

Eucalyptus re-sprouts would be sprayed with Garlon 4 to prevent sprouting. Garlon 4 would be directly applied to cut eucalyptus stumps once or twice annually during the second and third years of the proposed project. Potential negative effects on project site vegetation include mortality, morbidity, or negative reproductive effects as a result of over-spraying Garlon 4 onto nontarget species and the potential for vegetation or wildlife to come into contact with Garlon 4 through area soil or runoff. The beneficial effects associated with chemical reduction of eucalyptus re-sprouts include effectiveness in preventing the re-growth of eucalyptus trees. In addition, eucalyptus tree removal would encourage native vegetation to become reestablished, thereby providing better habitat for native plants and wildlife. Monitoring the response to chemical treatment, including additional treatments if necessary, would prevent stump re-sprouting.

To avoid possible negative effects to wildlife, herbicide would be hand-applied to eucalyptus trees during the dry season. To minimize over-spraying of herbicide onto wildlife, a biological monitor would be employed to safely remove any transient wildlife prior to application. In addition, a biological monitor would ensure that all aquatic, riparian, and/or wetland areas, including a 100-foot buffer zone, are fenced off with highly visible construction fencing prior to chemical use. Appendix I provides guidelines for the specific use of Garlon 4 by EBRPD,

including a chemical description of the compound, toxicity information, and a Material Safety Data Sheet (MSDS).

#### **4.1.5.1.4 Grazing**

Potential impacts from the introduction of cattle grazing at the grasslands at Site 603 in Anthony Chabot Regional Park include changes in the species composition or vegetation communities. Cattle graze in open grasslands and minimize shrub and tree encroachment. Therefore, the proposed grazing would likely benefit grasslands species over shrub- and woodland-adapted species. The grazing and trampling may help prevent the establishment of coyote bush in nonnative annual grasslands. Grazing may also increase the cover of native annuals and bunchgrasses.

Livestock fencing (five-strand barbed wire) would be installed to prevent livestock from straying outside of designated areas. Short grazing periods would be implemented to avoid impacts to native perennial grasses. Grazing would be monitored for seasonal production, grassland production, stocking rate, and quantity and quality of vegetation left. Monitoring would prevent potential soil erosion, expansion of weeds, and depletion of sensitive herbs.

#### **4.1.5.1.5 Monitoring Measures for All Vegetation Management Sites**

Monitoring, maintenance, and, in some cases, native plant revegetation would follow EBRPD vegetation management actions. Disturbance resulting from eucalyptus tree and Monterey pine thinning, shrub removal, grazing, and prescribed fires could potentially enable colonization of noxious weeds in the EBRPD treatment areas. EBRPD would undertake annual monitoring for 5 years to maintain less than 20 percent cover of invasive weeds listed by CalEPPC. Details of maintenance and revegetation measures are provided in Section 4.1.5.2.3.

#### **4.1.5.2 Special Status Species**

FEMA submitted a Biological Assessment to USFWS on July 5, 2000, and requested formal consultation for the Proposed Action Alternative. After a series of information exchanges between and among FEMA, EBRPD, and USFWS, USFWS issued a Biological Opinion (BO) and Incidental Take Statement for the Proposed Action Alternative (Appendix E) on August 14, 2001. The BO contains detailed species accounts for federally protected species that have the potential to be impacted by the Proposed Action Alternative, an assessment of the potential project impacts, and avoidance and mitigation measures. EBRPD agreed to the terms and conditions outlined in the BO and Incidental Take Statement on December 17, 2001 (Appendix G). Impacts to and avoidance and minimization measures for specific species are described below.

##### **4.1.5.2.1 Callippe Silverspot Butterfly**

No more than the total number of individuals inhabiting a maximum of 51 acres in any 1 year would be incidentally taken due to mortality, harm, or harassment during prescribed fires. In addition, EBRPD would minimize the potential for harm, harassment, or mortality to Callippe silverspot butterflies by complying with the following measures: (a) burn only one-fifth of any

grassland area for a given colony in any 1 year (to determine colonies, EBRPD would delineate potential habitat for Callippe silverspot butterflies or, in the absence of field-based habitat assessment for the host plant (Johnny jump-up [*Viola pedunculata*]), all grassland areas would be considered potential habitat; or (b) conduct adequate, USFWS-approved surveys for Callippe silverspot butterflies prior to vegetation removal; or (c) receive written concurrence from the USFWS that Callippe silverspot butterflies are not present in the project area; or (d) a combination of (a), (b), and (c).

#### **4.1.5.2.2 Alameda Whipsnake**

A transition from nonnative eucalyptus trees, acacia, Monterey pines, and French broom to a mosaic of native habitats of varying age classes and structure is expected to directly benefit Alameda whipsnake populations in the long term. This project would increase both the heterogeneity of the habitat and the available acreage for the Alameda whipsnake. Nonetheless, the project has the potential to “take” (through harassment, injury, mortality, or harm) individual snakes. It is estimated that take of Alameda whipsnake may occur through habitat modification due to the use of the ATBM and prescribed fire. Mortality and/or injury of Alameda whipsnake is authorized only for the prescribed burn and the use of the ATBM; activities associated with these actions, such as crushing from motorized vehicles, are not included in the authorization.

As part of the avoidance and/or mitigation measures for the proposed project, EBRPD would coordinate with USFWS and the California Department of Fish and Game (CDFG) to implement a research project focused on the effects of vegetation management, including prescribed fire, on the Alameda whipsnake. A full research proposal has been developed and submitted to USFWS and CDFG. EBRPD biologists would manage the research project jointly with these agencies and would develop annual reports on the results of the research. The research project would last for a minimum of 5 years.

The research project would be implemented at a location agreed to by the USFWS prior to and during implementation of the vegetation management activities described in this document. Live trapping before, during, and after vegetation management would occur. Radio telemetry could be included, depending on funding and permits. Vegetation recovery and whipsnake occurrence would be documented on an annual basis for the life of the proposed project. A second BO, dated April 30, 2002, includes approval of the research protocol and live-trapping methodology (Appendix E). CDFG has also approved the research project. Only USFWS-qualified personnel would be allowed to handle Alameda whipsnake for the purposes of the research project. Two of the proposed vegetation management sites within EBRPD jurisdiction would be utilized for the research project: 62.1 acres in Anthony Chabot Regional Park and 17.5 acres in Claremont Canyon Regional Preserve. The Anthony Chabot Regional Park site would be mechanically treated with an ATBM and then a prescribed fire is scheduled between mid November and mid March. The Claremont Canyon Regional Preserve site would only receive a mechanical treatment due to its proximity to urban neighborhoods. The use of the ATBM was not included in the previously referenced consultation for EBRPD. The USFWS estimates that ATBM equipment would result in impacts similar to those associated with a prescribed fire because snakes would have an equal opportunity to escape both actions under normal circumstances. It is estimated that 160 acres of the approximately 297 acres of suitable Alameda whipsnake habitat would be

affected by vegetation management actions. Huckleberry Regional Preserve is the only proposed project area that does not contain Alameda whipsnake habitat.

In compliance with the BO, prescribed fires would be implemented at most of the sites during the wetter months of fall or winter, when whipsnakes are expected to be underground and less susceptible to harm, except at Site 551, which would be burned in late summer to avoid impacts to *Presidio clarkia* (as described in Section 4.1.5.2.3). In areas used for slash piles, snake-proof drift fencing would be installed around the perimeter unless the piles are to remain permanent. This fencing would prevent the use of the piles by reptiles, including the Alameda whipsnake, and reduce the chance of incidental take of a snake during chipping or burning of piles. EBRPD would conduct a series of training sessions for staff and contractors and develop an informational brochure to train personnel on identifying the Alameda whipsnake and methods to avoid disturbing it.

#### **4.1.5.2.3 Special Status Plants**

Of the three federally listed plants with a potential to occur in the project areas, only *Presidio clarkia* is currently known to occur in specific project sites (at Sites 502 and 551). The USFWS August 14, 2001, BO states that the pallid manzanita at Huckleberry Regional Preserve is located over 200 feet from the area where eucalyptus trees would be removed and sprayed with Garlon 4, and therefore the activity is not expected to impact pallid manzanita (Appendix E). It is expected that Santa Cruz tarplant would not be impacted by project activities because it occurs outside the project areas (in Wildcat Canyon Park).

EBRPD would conduct CNPS/CDFG protocol-level surveys for *Presidio clarkia*, Santa Cruz tarplant, and pallid manzanita within the affected areas of the project sites and in a 500-foot buffer zone. Surveys would be conducted at the appropriate floristic period to identify the species. Any occurrences would be enclosed with highly visible, temporary construction fencing. EBRPD would also implement annual vegetation surveys in actively managed areas for threatened and endangered plants and supervise the installation of fencing around them.

Prescribed fire is a proposed management activity at Site 551, where *Presidio clarkia* is known to occur. Santa Cruz tarplant and pallid manzanita are unlikely to be impacted by prescribed fire unless undetected occurrences of these species occur at the burned sites or if a prescribed fire got out of control and spread outside the project site. If the burn inadvertently impacted any of these species, the effects would depend on the season of the burn and the intensity of the burn. All three federally listed species could potentially benefit from prescribed burns due to the reduction of exotic, competitive species, such as annual grasses and French broom.

The BO requires that a revegetation plan be submitted to the USFWS for review and approval prior to performing any revegetation activity proposed for areas occupied by federally listed plant species. Revegetation plans would consist of native plants that are local to the Hills. Seeds and cuttings would be collected from the project sites, if possible, or from the same watershed as the site, and grown by a nursery experienced with local native plants. Revegetation options would include hydroseeding, container planting, or other acceptable techniques.

#### **4.1.5.2.4 Biological Monitoring**

EBRPD would supply a qualified biological monitor to review and inspect the vegetation removal operations. The comprehensive duties of the biological monitor would be as follows:

- 1) Supervise the Alameda whipsnake project and coordinate with an authorized contractor to deploy traps for implementation according to the USFWS August 14, 2001, BO guidelines regarding research (Surveys would be conducted in spring and fall for 1 year prior to the initiation of any vegetation management work. Follow-up surveys would be conducted for 5 consecutive years after treatment.)
- 2) Supervise the installation of “snake-proof” drift fencing around slash piles that are scheduled for future prescribed fires (i.e., pile burns)
- 3) Monitor vegetation management activities to avoid impacts to nesting birds
- 4) Conduct a series of staff and contractor training sessions on the identification of Alameda whipsnake, rare plants and other sensitive species, drainage protection, and erosion control measures
- 5) Develop an informational brochure to distribute to staff and contractors
- 6) Train staff and contractors to inspect the equipment for leaks or spills and conduct daily checks for potential wildlife activity around the machinery
- 7) Train staff on the application of herbicides and inspect operations
- 8) Implement annual vegetation surveys in active managed areas for special-status plants and supervise the installation of fencing around them; coordinate with staff to conduct annual surveys to maintain low levels of noxious weeds in treated areas
- 9) Be present for all vegetation management activities within the following buffer zones: 200 feet for Santa Cruz tarplant (except for livestock grazing), 200 feet for pallid manzanita, and 500 feet for Presidio clarkia (except for hand treatments, where the monitoring would be reduced to a 200-foot buffer)
- 9) Conduct botanical surveys in spring to identify potential habitat for the Callippe silverspot butterfly and contact USFWS for permission to remove
- 10) Be on site during all vegetation management treatments to inspect for Alameda whipsnakes and to inform fire crews with an educational program prior to treatment
- 11) Conduct post-burn surveys for injured or dead wildlife
- 12) Conduct raptor nest surveys in trees planned for removal
- 13) Quantify vegetation during baseline year within treatment and control areas, immediately following treatment, and twice each year following each treatment for 5 years
- 14) Develop an annual report for submission to FEMA and USFWS

**4.1.6 Alternative 3: Modified Methods****4.1.6.1 Vegetation and Wildlife**

Impacts to vegetation and wildlife under Alternative 3 would be similar to those described under the Proposed Action Alternative. Substituting horse logging for other logging methods, as proposed under this alternative, would likely reduce impacts to vegetation and wildlife when compared to other mechanical logging methods. However, some disturbance (e.g., trampling, crushing, or grazing) would occur during horse-logging operations. BMPs to minimize soil erosion would be implemented as described for the Proposed Action Alternative. Access, staging, log skidding, and stockpiling would occur on existing roads or trails or within the footprint of the proposed disturbance area.

Sucker bashing would be conducted frequently by hand crews over an extended period of time. This activity could result in trampling or crushing of nontarget vegetation or wildlife.

Hand-clearing would be implemented at Site 252. Some trampling or crushing of vegetation and wildlife by hand crews would likely occur as a result.

The use of goats for grazing under Alternative 3 would change the vegetative composition of the landscape in these areas in much the same way as cattle grazing and hand-clearing methods. Therefore, impacts to vegetation and wildlife would be similar to those described under the Proposed Action Alternative. However, because goats are indiscriminate grazers, shrubs and trees would potentially experience greater impacts from goat grazing than cattle grazing or hand-clearing. Selected native shrubs and trees would be protected from extensive grazing by fencing. EBRPD would conduct monitoring to prevent potential soil erosion, expansion of weeds, and depletion of sensitive herbs. Grazing would be monitored by EBRPD for seasonal production, grassland production, stocking rate, and quantity and quality of residue left. Goats and vegetation would be monitored, and goats would be removed when vegetation is reduced to levels sufficient for fire hazard reduction while preserving the integrity of the landscape. Perennial grasses are sensitive to season and duration of grazing; therefore, short-grazing periods would be implemented to avoid impacts to areas where these grasses are present (Appendix C).

**4.1.6.2 Special-Status Species**

The potential impacts to special-status species would be similar to those for the Proposed Action Alternative. Therefore, FEMA would need to initiate consultation with USFWS prior to implementation of Alternative 3 if EBRPD were to select this alternative for the proposed vegetation management activities.

**4.2 GEOLOGY, SEISMICITY, AND SOILS****4.2.1 Geology**

The Hills are part of the Northern California Coast Ranges. The Coast Ranges are characterized by northwest-trending ridges and valleys that parallel major strike-slip faults of the San Andreas

fault system. The strata are complexly folded and faulted. Fold axes generally trend northwest reflecting northeast-southwest compressional tectonic stresses.

Geologic deposits in the area are susceptible to landslides and soil erosion to varying degrees. A risk assessment performed by Springer et al. (1992) after the 1991 East Bay Hills Fire provided a relative ranking of landslide susceptibility for some of the strata. Additional data on relative landslide susceptibility are adapted from Radbruch (1957), Davenport (1985), Haydon (1995), and Majmundar (1996a, 1996b). Table 3 presents the relative susceptibility of various units to landslide.

**Table 3  
Relative Landslide Susceptibility of Geologic Units in the  
East Bay Regional Park District**

<b>Landslide Susceptibility</b>	<b>Unit</b>
Low	Claremont Shale Leona Rhyolite Tice Shale Bald Peak Basalt
Medium	Franciscan Complex Moraga Formation Great Valley Group - sandstone
High	Orinda Formation Sobrante Sandstone Siesta Formation Great Valley Group - siltstone and claystone

Geologic deposits in the area vary from Late Mesozoic (over 65 million years old) to Holocene (less than 10,000 years old). The Franciscan Complex and Great Valley Group are the oldest rocks and are mostly contemporaneous in age. The Franciscan Complex was deposited in an offshore trench on top of a subducting slab, then subsequently uplifted and exposed. The Franciscan Complex consists of a mixture of sandstone, shale, basalt, and chert that have been subjected to various degrees of high-pressure metamorphism. Many exposures of Franciscan Complex consist of isolated blocks of hard rock in a matrix of sheared clay. Soil creep, debris flows, and landslides are common in areas underlain by the Franciscan Complex. The Franciscan Complex is separated from the Great Valley Group by the Coast Range thrust fault and serpentinized ultramafic rocks of the Coast Range Ophiolite.

The Great Valley Group was deposited on submarine fans that occupied a forearc basin adjacent to the Franciscan trench. The depositional mechanism was turbidity currents that laid down alternating sequences of sandstone, siltstone, and claystone. In areas of high current energy, the deposits were largely sandstone. The lithology was dominated by claystone and siltstone in low energy areas. Areas underlain by Great Valley claystone and siltstone are prone to landsliding and soil creep. Areas underlain primarily by sandstone are relatively more stable but may be susceptible to rockfalls and landslides where the strata are at an unfavorable orientation.

The Paleocene (65 to 58 million years old) Pinehurst Shale overlies the Great Valley Group. It contains siliceous shale beds 3 inches to 3 feet thick and is highly weathered. It is easily eroded;

however, the potential for landslides on it is relatively low (Radbruch 1957). Discontinuous exposures of fine-grained Eocene (58 to 37 million years old) sandstone are found in fault contact with underlying Mesozoic and Paleocene rocks. This Eocene sandstone is highly sheared and weathered. The potential for erosion and landslides in it is moderately high.

The Sobrante Sandstone, Claremont Shale, and Tice Shale are members of the Upper Miocene (5 to 11 million years old) Monterey Formation, which is found in a wide area of the California Coast Ranges. The Sobrante Sandstone occupies discontinuous exposures. It underlies moderately steep slopes and stands well on 45 degree cuts (Radbruch 1957). The Claremont Shale consists of thin-bedded siliceous shale interlayered with silty shale. It is complexly folded. Slopes in it are relatively stable except where the strata are oriented unfavorably (Springer et al. 1992). The Tice Shale is found on steep hill slopes. It consists of thin beds of shale and fine-grained sandstone. Slopes in it are relatively stable, and it stands well on cuts steeper than 45 degrees (Radbruch 1957).

The Contra Costa Group is Pliocene (2 to 5 million years old). Some studies divide the Contra Costa Group into various units: the Orinda Formation, the Moraga Formation, the Siesta Formation, and the Bald Peak Basalt. Landslides are problematic in all of these units. The Orinda Formation consists of poorly consolidated conglomerate, siltstone, and claystone. Clays in the Orinda Formation are expansive. The erosion potential of the Orinda Formation is relatively high. Shallow landslides are common on slopes of 17 degrees or more (Haydon 1995). The Moraga Formation consists of interlayered basalt and andesite flows with some interbedded clastic rocks and rhyolitic tuff. The volcanic portions of the Moraga Formation are relatively resistant to erosion and slope instability. However, the clastic (alluvial) portions contain numerous landslides and are susceptible to erosion (Radbruch 1957). The Siesta Formation is limited in extent and consists of finely laminated silty claystone and sandstone with minor conglomerate, limestone, and tuff. Clays in the Siesta Formation are expansive, and it is susceptible to erosion and landslides. The Bald Peak Basalt is interlayered with poorly consolidated sedimentary rocks. It is highly fractured and has a blocky structure. The Bald Peak Basalt is generally hard and resistant to erosion. Landslides in it are mostly rockfalls.

The Leona Rhyolite is Pliocene to Pleistocene (8,000 to 5 million years old) in age. It consists of rhyolite flows and tuffs as well as intrusive sills and dikes. The rhyolite is rich in pyrite, which was exploited at the Leona Mine to make sulfuric acid. Slopes on the rhyolite are relatively stable. However, debris slides occur where the rock is excessively fractured and weathered (Radbruch 1957).

#### **4.2.2 Seismicity**

EBRPD lands lie in a region of high seismicity. The entire area would experience strong ground shaking in the event of an earthquake. Low-lying areas underlain by soft soils would tend to have more intense shaking than areas underlain by bedrock. However, strong ground shaking is a substantial hazard throughout the region. Strong ground shaking can trigger landslides on hillsides and cause liquefaction of saturated granular soils

Earthquake sources include the major strike-slip faults of the San Andreas fault system, blind thrust faults, and a deep zone of seismicity on the east side of the California Coast Ranges,

known as the Coast Ranges Sierran Block Boundary Zone (Wong, Ely, and Kollman 1988). The Working Group on Earthquake Probabilities (1999) has calculated a 70 percent probability of one or more major earthquakes on one or more of the regional faults by the year 2030. Table 4 lists the major faults, their approximate distance from EBRPD lands, and their maximum credible earthquakes.

**Table 4  
Major Seismic Sources Near the East Bay Regional Park District Sites**

<b>Fault</b>	<b>Type of Fault</b>	<b>Distance from Parks (miles)</b>	<b>Maximum Credible Earthquake (M<sub>w</sub>)</b>
Hayward	RL strike-slip	1 (average)	7.1
Calaveras	RL strike-slip	5	6.7
Concord	RL strike-slip	6	6.7
San Andreas	RL strike-slip	20	7.9
Mt. Diablo Thrust	Thrust	12	6.7
Greenville fault	RL strike-slip	18	6.7
Coast Ranges – Sierran Block Boundary	Thrust	24	6.8

RL = right lateral  
M<sub>w</sub> = moment magnitude

**4.2.3 Soils**

The project sites are mostly on hillsides and near the tops of ridges. The soils in these areas are generally shallow, and the erosion hazard is generally high to very high. Vegetation tends to reduce the potential for shallow erosion. Information on soils in the area was obtained from the Soil Conservation Service (1977, 1981).

The project sites in Tilden Regional Park are underlain by Gilroy Clay Loam, a soil that forms on basic igneous rock (Bald Peak Basalt and Moraga Formation), and metasedimentary rock (Franciscan Complex). Bedrock is generally 1.5 to 3.5 feet below ground surface where this soil is exposed. It has a moderate shrink-swell capacity and a high potential for erosion.

The north side of Claremont Canyon from Grizzly Peak Boulevard down to the UC Clark Kerr campus is underlain by Meymen Loam. This light grayish-brown acid loam forms on shale bedrock and the erosion hazard is high to very high. This soil type also underlies the study area at the northern part of Redwood Regional Park.

South of Claremont Canyon, the soil belongs to the Maymen–Los Gatos association, which is formed from the weathering of sedimentary rocks. It is excessively drained, has moderate permeability, and the erosion hazard is high to very high.

The study site on the west side of Redwood Regional Park is underlain by Millsholm Silty Loam, which is a medium acid loam that exhibits rapid runoff and a very high erosion hazard. The study areas in Anthony Chabot Regional Park are also underlain by Millsholm Silty Loam.

Soils in the Leona Heights Regional Open Space consist of Maymen Loam, Maymen-Los Gatos Loam, and Millsholm Silty Loam. This area has a high to very high erosion hazard.

**4.2.4 Alternative 1: No Action**

Under the No Action Alternative, the status of the geologic hazards within EBRPD lands would remain the same. The area would remain susceptible to landslides triggered by earthquakes and/or heavy rains. The high to very high erosion potential of area soils and resulting soil loss would persist. If a future wildfire were to occur in the parkland areas, stabilizing vegetation would be removed and the result would likely be increased runoff, increased vulnerability to soil erosion, and increased potential for shallow landslides and debris flows from exposed area soils.

**4.2.5 Alternative 2: Proposed Action**

Under the Proposed Action Alternative, potential impacts to area geology and soils include increased water and wind erosion of exposed project area soils and the resulting soil loss; compaction of area soils from cattle grazing, logging, mechanized equipment, and/or hand crews; and an increased risk of shallow landslides or debris flows from exposed surfaces. In addition, sites where Garlon 4 is used to control regeneration of eucalyptus sprouts have the potential for incidental introduction of herbicide into project area soils. No increase in seismic activity is expected from the Proposed Action Alternative.

Prescribed fires during any season, especially during the winter, could create disturbances that result in increased soil erosion. To minimize potential impacts to geological resources, EBRPD would develop and implement erosion control plans for all sites proposed for prescribed fire. BMPs, such as weed-free haybales, silt fences, or mulch, would be used at all prescribed fire sites. A qualified EBRPD representative would inspect the project area to ensure that proper erosion control methods are applied throughout the project duration. To minimize compaction of area soils, all access, staging, log skidding, and stockpiling associated with logging, mechanical equipment, and hand-clearing practices would occur within existing roads or trails or within the footprint of proposed disturbance areas. By leaving the tree stumps/root systems from logging operations in place until vegetation becomes reestablished in the logged areas, soil erosion and debris flows would be reduced. To avoid incidental introduction of herbicide into project area soils, Garlon 4 would only be applied by hand by a licensed contractor during the dry season. The environmental fate of Garlon 4 in soil is discussed in EBRPD use guidelines (Appendix I).

The potential for a wildfire to cause increased erosion, soil loss, and landslides from the removal of stabilizing vegetation would be reduced under this alternative.

**4.2.6 Alternative 3: Modified Methods**

Impacts to area geology and soils under Alternative 3 would be similar to those described under the Proposed Action Alternative. However, because herbicide would not be used at nine sites under Alternative 3, incidental introduction of Garlon 4 to soils at these sites would not occur. Replacing herbicide use with sucker bashing would increase the potential for compaction or erosion of area soils from frequent visits by sucker-bashing crews. To ensure that goats do not overgraze project sites, the protective measures discussed in Section 4.1.6.1 would be implemented.

### 4.3 WATER RESOURCES

#### 4.3.1 Hydrology and Water Quality

Average annual precipitation in the project area ranges from 16 inches around the Port of Oakland to 26 inches in the Montclair area of the Hills (Miller and Koh 1993). Due to the steep topography of the Hills, much of the precipitation is transformed into surface-water runoff. However, as the surface water passes over areas with sandy or highly porous soils, some of it percolates into the groundwater aquifer through recharge areas. The local aquifer consists of scattered unconnected pockets of water, or lenses, of various sizes. The depth to the water table varies, but tends to increase in bands parallel to the Bay shoreline approaching the Hills. In the Hills and upper portions of the East Bay Plain, depth to the water table often exceeds 20 feet (Miller and Koh 1993).

All of the parks proposed for vegetation management activities contain water resources in the form of perennial creeks, streams, springs, ponds, or intermittent water sources. In addition, Lake Chabot, a 315-acre emergency water supply reservoir constructed in 1874 and 1875, is on lease to EBRPD by EBMUD for recreational use. EBRPD plans, manages, and operates Lake Chabot Recreation Area under the terms and conditions of a 50-year park and recreation lease and according to the provisions and conditions of the district's revised domestic water supply permit (Jones and Stokes Associates 1999).

In addition to Lake Chabot, many EBRPD lands contribute significantly to the watersheds of other local drinking water reservoirs, including San Pablo Reservoir and Upper San Leandro Reservoir. Because much of the EBRPD land is undeveloped open space within drinking water supply watersheds, water quality throughout the area is relatively good. The only exception noted in the project vicinity (on non-EBRPD lands) was some low pH data collected from drainage related to the Leona Mine (URS Corporation 2000). The lower reaches of San Leandro Creek, Wildcat Creek, and San Pablo Creek were listed on California's List of Impaired Waters for 1998 (USEPA 2000). All three of the impacted reaches of these creeks are downstream of the project area, and all are impacted by urban runoff/storm sewers. All three creeks are considered low priority for cleanup. The primary hydrologic characteristics of each of the parks in the project area and the watersheds to which they contribute are discussed below:

- **Tilden Regional Park.** Although a small portion of Tilden Regional Park contributes to the San Pablo Reservoir watershed, the majority of the park drains to Wildcat Creek, which originates in the eastern portion of the park and runs westerly until its confluence with San Pablo Creek near the Richmond inner harbor. Several tributaries feed Wildcat Creek, all of which originate to the north. Other hydrologic features within the park include Lake Anza and Jewel Lake, which were created by constructing small dams at two locations along Wildcat Creek. Several springs and intermittent drainages also occur throughout the canyons in the park. All of the project sites within Tilden Regional Park are located to the south of Wildcat Creek, and many are located adjacent to the northern side of Wildcat Canyon Road. None of the Tilden Regional Park project sites contain creeks or other water resources.
- **Claremont Canyon Regional Preserve.** Claremont Canyon Regional Preserve is bisected by Claremont Creek, which runs southwestward from the Hills. The northernmost end of

Claremont Creek forks into two branches with one branch emanating from Telegraph Canyon, and the other branch roughly following Fish Ranch Road for approximately half a mile. The western edge of Site 252 is located adjacent to a portion of Claremont Creek.

- **Sibley Volcanic Regional Preserve.** Sibley Volcanic Regional Preserve contributes to two of the local drinking water supply watersheds: the Upper San Leandro Reservoir and the San Pablo Reservoir. The southeastern portion of the preserve, near Sites 351 and 302, are located just north of the beginning of San Leandro Creek, which drains into the Upper San Leandro Reservoir. The northwestern portion of the park contributes substantially to the San Pablo Reservoir watershed. Several sites (Sites 301, 304, 305, 306, and 308) are located within this region. A small, unnamed creek lies to the north of Site 306 and meanders to the northwest to the Fish Ranch Road vicinity. Other hydrologic features of the preserve include two small ponds in the northwestern portion of the park.
- **Huckleberry Regional Preserve.** Huckleberry Regional Preserve contributes a small portion of the San Leandro Creek watershed. A portion of San Leandro Creek, which flows in a southeasterly direction in this area, is located in the central portion of the park, adjacent to a portion of the Skyline Trail. Both of the sites within Huckleberry Preserve (Sites 401 and 402) are located along Skyline Boulevard, which is located to the south of San Leandro Creek.
- **Redwood Regional Park.** Redwood Regional Park contributes to the San Leandro Creek watershed. The dominant hydrologic feature of Redwood Regional Park is Redwood Creek, which branches into two forks near the Redwood Gate park entrance off Redwood Road. The northern fork originates near the western edge of the park and parallels the Stream Trail for most of its length. The creek and banks are designated as a Resource Protection Area to encourage the restoration of riparian habitat. Sites 503 and 552 are located to the north of the western end of the northern fork of Redwood Creek. The southern fork of Redwood Creek is also fed by two small unnamed tributaries. The first tributary is described below under Anthony Chabot Regional Park. The second tributary originates in the Serpentine Prairie Resource Protection Area, in the vicinity of Sites 502 and 551. Both of the tributaries are intermittent drainages.
- **Anthony Chabot Regional Park.** Anthony Chabot Regional Park is located entirely within the San Leandro Creek watershed, contributing to two major tributary streams: Redwood Creek and Grass Valley Creek. Although both of these tributaries drain in an easterly direction, Redwood Creek meets San Leandro Creek at one “arm” of the Upper San Leandro Reservoir, while Grass Valley Creek drains into the eastern arm of Lake Chabot. The area surrounding Grass Valley Creek was the subject of a watershed restoration project in the 1980s to reduce vegetation loss, soil compaction, erosion, and sedimentation caused by motorcycle use in the park (San Francisco Foundation 1990).

The San Leandro Creek watershed is a public water supply watershed, with restricted hiking access to the Upper San Leandro Reservoir (owned and managed by EBMUD) and recreational access allowed on EBRPD lands and at Lake Chabot (on lease to EBRPD). During heavy winter and spring storms when the Upper San Leandro Reservoir reaches its capacity, runoff from the reservoir flows over the spillway and down San Leandro Creek into Lake Chabot. In addition to overflows from the Upper San Leandro Reservoir, Lake Chabot

also receives runoff from Anthony Chabot Regional Park lands, EBMUD watershed lands, adjacent urban development (e.g., Skyline Boulevard, Redwood Road, and Lake Chabot Road), Redwood Regional Park, Huckleberry Regional Preserve, and a portion of Sibley Volcanic Regional Preserve. Below Lake Chabot, San Leandro Creek continues southward and eventually drains into San Leandro Bay near Arrowhead Marsh.

Other hydrologic features of Anthony Chabot Regional Park include several springs along Redwood Road and in other draws and ravines and a small drainage west of Bort Meadow (EBRPD 1982). The northern portion of Site 603, which is located in a ravine north of Parkridge Drive, also contains a small tributary to Redwood Creek. The northwestern portion of Site 610 is adjacent to a portion of Grass Valley Creek, and a small, intermittent, unnamed tributary to Grass Valley Creek is located within the northwestern corner of these project sites.

- **Leona Heights Regional Open Space.** Leona Heights Regional Open Space is located within the Arroyo Viejo watershed, which does not feed any of the local drinking water reservoirs. The park itself contains a portion of the Rifle Range Branch of Arroyo Viejo Creek, an intermittent drainage that originates in the northeastern corner of the park (to the east of Site 751) and runs in a southerly direction through the park until it terminates at a detention basin installed near Keller Avenue. A culvert installed beneath Keller Avenue diverts overflow from the detention basin to a section of the Rifle Range Branch traversing the Oak Knoll Naval Hospital (EBRPD 1999). The Rifle Range Branch passes to the south of the southwestern portion of Site 701. A second unnamed intermittent drainage, which runs the length of Leona Canyon, connects with the Rifle Range Branch near the intersection of the Pyrite and Leona Canyon trails.

#### **4.3.1.1 Alternative 1: No Action**

Under the No Action Alternative, EBRPD would not undertake vegetation management activities on its property in the Hills. No direct impacts to water resources or water quality would occur. However, in the event of a future wildfire, fire residue and eroded soils would have the potential to wash into rivers and other drainages, potentially affecting water quality. Hydrology would not be impacted by the No Action Alternative.

#### **4.3.1.2 Alternative 2: Proposed Action**

The Proposed Action Alternative would reduce the potential for a catastrophic wildfire to occur in the future. A large-scale wildfire could cause substantial soil erosion and ash deposition into area waterways. With the threat of a wildfire decreased, long-term beneficial indirect impacts to local water resources could be expected.

Potential direct impacts to water resources under the Proposed Action Alternative include increased soil erosion and/or sedimentation downstream of cleared, burned, or grazed areas through the removal of protective groundcover, runoff of fire residue/ash from prescribed fire sites, and incidental introduction of herbicide (Garlon 4) into local drainages and/or water basins. Livestock grazing could also impact local drainages through the introduction of bacteria, organic matter, and/or nitrogen-containing by-products from animal waste.

To minimize the impacts associated with the Proposed Action Alternative, EBRPD would prepare an individual erosion control plan specific to each treatment area for the proposed vegetation management sites that is consistent with standards set forth by the Regional Water Quality Control Board. Furthermore, EBRPD would not conduct prescribed fires, apply herbicide, graze livestock, or perform logging activities such as tree felling and skidding within 100 feet of the centerline of any blue line stream, intermittent tributary, or dry drainage that exclusively drains rainwater runoff.

In implementing the erosion control plans, EBRPD would employ BMPs such as installing silt fences, mulch, geosynthetic mats, and/or log rolls on or around cleared or burned slopes to reduce erosion and ash movement. A qualified EBRPD representative would inspect the project area to ensure that proper erosion control methods are applied throughout the project duration. In addition, project sites in the vicinity of storm drains would require the installation of storm drain protection, such as hay bales, prior to the onset of vegetation management activities. To minimize incidental or secondary introduction of Garlon 4 into area drainages or groundwater aquifers, Garlon 4 would only be applied to eucalyptus stumps and re-sprouts by hand by a licensed contractor during the dry season.

#### **4.3.1.3 Alternative 3: Modified Methods**

Under Alternative 3, potential impacts to local water resources and water quality would be similar to those described under the Proposed Action Alternative (the impacts associated with Garlon 4 application at nine of the proposed sites would not occur under this alternative). Erosion associated with horse logging, hand crews, or crews conducting sucker bashing would potentially impact water resources in the form of increased sedimentation downstream of the project sites. As with the Proposed Action Alternative, no vegetation management activities would occur within 100 feet of creeks or other drainages. The potential impacts to water resources associated with goat grazing would be similar to impacts from cattle grazing, though goats would not be left on site for extended periods (to ensure that vegetation is not overgrazed). Therefore, under Alternative 3 the potential for contamination of water resources from bacteria or the introduction of organic matter would be slightly less for Site 603, but greater for Sites 308 and 701 when compared with the Proposed Action Alternative. By replacing the prescribed fire treatment at Site 252 with hand-clearing activities, no fire residue would be left at this site, and the potential for erosion/sedimentation under Alternative 3 would be less than that under the Proposed Action Alternative due to the less comprehensive nature of hand-clearing.

Potential beneficial impacts of Alternative 3 are similar to those described under Alternative 2. Alternative 3 may provide long-term beneficial impacts to local water resources.

#### **4.3.2 Executive Order 11988: Floodplain Management**

As indicated on flood insurance rate maps of the project areas, the project sites are not located within a 100-year floodplain.

**4.3.2.1 Alternative 1: No Action**

Maintaining the status quo would not impact the 100-year floodplain.

**4.3.2.2 Alternative 2: Proposed Action**

None of the sites proposed for vegetation management activities are located within a 100-year floodplain. Therefore, the proposed project would not impact a 100-year floodplain and would comply with Executive Order (EO) 11988.

**4.3.2.3 Alternative 3: Modified Methods**

None of the sites proposed for vegetation management activities are located within a 100-year floodplain. Therefore, the proposed project would not impact a 100-year floodplain and would comply with EO 11988.

**4.3.3 Executive Order 11990: Protection of Wetlands**

As discussed in Section 4.3.1, several creeks, reservoirs, and intermittent drainages are located within the parks proposed for vegetation management activities. However, all of the proposed project sites have been selected to avoid area waterways. Potential jurisdictional wetlands located within or in the immediate project vicinity include a small ponding area within the northern portion of Site 610, the area surrounding the intermittent drainage to Grass Valley Creek in the northwestern portion of Site 610, the northwestern portion of Site 252, where it is adjacent to Claremont Creek, and the intermittent drainage located in the northern portion of Site 603.

**4.3.3.1 Alternative 1: No Action**

Under the No Action Alternative, no direct effects would occur to wetlands in the project vicinity. However, future wildfires would cause fire residue and unstable soils to wash into water basins, potentially creating adverse effects to downgradient wetlands.

**4.3.3.2 Alternative 2: Proposed Action**

Under the Proposed Action Alternative, no work would occur within 100 feet of wetlands or riparian areas. These areas would be fenced off using highly visible, temporary construction fencing. In addition, the BMPs discussed in Sections 4.2.5 and 4.3.1.2 would be employed to prevent soil and/or sediment from washing into wetland or riparian areas. Therefore, the Proposed Action Alternative would be in compliance with EO 11990.

**4.3.3.3 Alternative 3: Modified Methods**

Under Alternative 3, potential impacts to wetland resources would be identical to those described under the Proposed Action Alternative.

#### **4.4 AIR QUALITY**

In 1970, the U.S. Environmental Protection Agency (USEPA) established national ambient air quality standards for six “criteria pollutants”: nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), lead, and particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>). Areas where the monitored concentration of a pollutant exceeds the federal standard are classified as “nonattainment” for that pollutant. If the monitored concentration is below the standard, the area is classified as “in attainment.”

The study area for the proposed project is within the jurisdiction of Bay Area Air Quality Management District (BAAQMD) and is classified as being in attainment of all federal standards except for O<sub>3</sub> (California Air Resources Board 1999).

##### **4.4.1 Alternative 1: No Action**

Under the No Action Alternative, no pollutant emissions would directly impact air quality. However, in the event of a wildfire, the resulting smoke would cause temporary adverse impacts to air quality. Smoke from a fire consists of carbon dioxide (CO<sub>2</sub>), water vapor, particulates (some of which contain volatile organic compounds [VOCs]), and CO. In addition, exhaust from support vehicles used in fighting the wildfire would cause a slight, temporary increase in PM<sub>10</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub> precursors. Soils exposed by a wildfire would increase PM<sub>10</sub> levels through wind erosion.

##### **4.4.2 Alternative 2: Proposed Action**

Under the Proposed Action Alternative, prescribed fires would emit CO<sub>2</sub>, water vapor, particulates (some with VOCs), CO, PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub> precursors. Because the prescribed fires would be conducted in a controlled manner, EBRPD would reduce the impacts to air quality by monitoring meteorological conditions and planning the burns to coincide with weather conditions conducive to dispersal of fire-induced smoke. In addition, fewer support vehicles would be necessary to combat the smaller-scale fires, thereby minimizing emissions of air quality pollutants from support equipment. In performing the prescribed fires or burning the slash piles associated with the proposed project, EBRPD would comply with BAAQMD and CDF requirements regarding permitting and public notification prior to initiating burns. Due to new regulations imposed by the California Air Resources Board, prescribed fires for wildland vegetation management requires written authorization from the Air Pollution Control Officer prior to burning activities. In addition, burning is only permitted on specific “burn days” each month (designated by BAAQMD). EBRPD would comply with these regulations.

Impacts to air quality associated with the sites proposed for logging or mechanized and hand-clearing would include a temporary increase in PM<sub>10</sub> from exposed soil and/or tree-felling and skidding activities as well as negligible increases of PM<sub>10</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub> precursors from mechanical equipment exhaust. To minimize the effects to air quality, EBRPD would maintain properly tuned mechanical equipment, minimize idling time of support vehicles, and employ dust control measures, such as watering down project sites, as necessary.

No impacts to air quality are expected from herbicide use due to the small-scale, localized, hand-applied methods and the nonvolatile nature of the herbicide. Also, the particle size of the herbicide spray would cause it to sink, so it would not affect air quality.

#### **4.4.3 Alternative 3: Modified Methods**

Under Alternative 3, potential impacts to air quality would be similar to those described under the Proposed Action Alternative. These impacts include a temporary increase in CO<sub>2</sub>, water vapor, particulates (some with VOCs), CO, PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub> precursors from prescribed fires, a temporary increase in PM<sub>10</sub> from exposed soil, and negligible increases in PM<sub>10</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub> precursors from mechanical equipment. To minimize the effects to air quality, EBRPD would conduct prescribed fires in accordance with BAAQMD, CDF, and California Air Resources Board regulations, maintain properly tuned mechanical equipment, minimize idling time of support vehicles, and employ dust control measures, such as watering down project sites, as necessary. Impacts associated with prescribed fires would be slightly less under Alternative 3 than under the Proposed Action Alternative due to the elimination of the prescribed fire treatment at Site 252.

### **4.5 CULTURAL RESOURCES**

In addition to review under NEPA, consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act (NHPA) and implemented by 36 CFR 800. Requirements include identifying significant historic properties and districts that may be affected by a federal undertaking and mitigating adverse effects to those resources.

URS Corporation conducted a literature review and an intensive pedestrian inventory on behalf of FEMA in May and June 2000. Local Native American groups were consulted and additional historical research for the proposed project was performed as part of this EA. The results of these efforts are documented in *Final Cultural Resources Technical Report: Cultural Resource Reconnaissance for the Proposed East Bay Regional Park District Fire Mitigation Projects, Alameda and Contra Costa Counties, CA* (FEMA 2000).

#### **4.5.1 Alternative 1: No Action**

Under this alternative, no federal undertaking would occur. Therefore, compliance with Section 106 of NHPA would not be required. The potential would exist for wildfires to expose or destroy historically important resources.

#### **4.5.2 Alternative 2: Proposed Action**

FEMA contacted California Native American Heritage Commission (NAHC) to request a review of its Sacred Lands Files and a list of individuals or groups it believes should be contacted for information or concerns related to the project area. The NAHC responded on May 25, 2000, with a negative search of its Sacred Lands Files. FEMA consulted with the individuals and groups recommended by NAHC; no legitimate concerns about the proposed project or indications of traditional cultural properties were noted during this consultation. FEMA initiated consultation

with the California State Historic Preservation Officer (SHPO) for the Proposed Action Alternative on July 3, 2000. From information provided by FEMA, the SHPO concurred with FEMA's determination on July 11, 2000, that no properties eligible for the National Register of Historic Places would be affected by the Proposed Action Alternative (Appendix J). If cultural resources are revealed during project activities, work in the vicinity of the discovery would be halted and EBRPD would notify FEMA immediately. EBRPD would take all reasonable measures to avoid or minimize harm to the discovered resource until FEMA further consults with the SHPO.

### **4.5.3 Alternative 3: Modified Methods**

The impacts associated with Alternative 3 would be similar to those associated with the Proposed Action Alternative. The components of Alternative 3 that differ from those described in the Proposed Action Alternative would result in less ground disturbance than the components of Alternative 2. Nonetheless, FEMA would consult with SHPO prior to EBRPD implementing this alternative.

## **4.6 VISUAL RESOURCES**

A visual assessment was performed to identify, describe, and map visual resources that might be affected by the alternatives. Baseline data were recorded in sufficient detail to allow assessment of direct and indirect impacts of the alternatives. The visual resource study was conducted using methodologies developed by both the U.S. Forest Service (1974) and the Federal Highway Administration (undated).

A description of visual assessment methods, terms, and concepts are included in Appendix K to help the reader understand and evaluate the visual environment of the project area and the assessment of potential effects.

### **4.6.1 Visual Character and Quality of the Project Area**

The project area is within the California Coast Range Section of the Pacific Border Physiographic Province (Fenneman 1931). The seven parks are situated in the Hills and run (from north to south) along San Pablo Ridge, the Berkeley Hills, and the San Leandro Hills. The project area elevations range from 440 feet in Leona Heights Regional Open Space to 1,900 feet in Tilden Regional Park. Views from the different parks include San Francisco Bay and the cities of San Francisco and Oakland to the west, San Pablo Bay and the Marin Headlands to the northwest, Mount Diablo to the southeast, San Pablo Reservoir to the northeast, and San Leandro Reservoir to the south.

The landscape surrounding the project area consists of mostly open space, including protected watersheds to the east, and suburban housing. Land use other than open space and residential near Leona Heights Regional Open Space includes Merritt College to the north. Claremont Canyon Regional Preserve is bounded by Claremont Resort and Spa to the south and UC residential property (Clark Kerr Campus) to the west (previously utilized as the California School

for the Deaf and Blind). LBNL and facilities for the UC Berkeley are within 0.5 mile of some sites.

The vegetation within the project area is composed of large stands of blue and red gum eucalyptus trees, Monterey pines, mixed oak/bay woodlands, redwood and riparian forest, mixed chaparral, north coastal scrub, successional scrub, exotic shrubs and perennials (including French broom and acacia), and a mix of grasses dominated by annual exotic grasses.

The visual quality within the project area is generally Variety Class B, with some Variety Class A. Hilly landforms, vegetation cover, and suburban development are common within the regional landscape. The vegetation creates a dense medium texture of landcover and provides a visual continuity or flow of pattern. The variety of vegetation types also results in an intermixing of visual form, color, and texture patterns. The area consists of recreational parks and has value as open space. The most frequent view is of nearby hillsides, valleys, roads, and residences. Certain vista points offer memorable views of San Francisco Bay and Mount Diablo. In some areas, including the southernmost portion of the project area in Anthony Chabot Regional Park, the scenery is impacted by existing disturbances including transmission lines.

#### **4.6.2 Viewsheds and the Sensitivity of the Project Area**

Viewer groups generally include recreational users of parks (hikers, cyclists, and equestrians); travelers utilizing roadways that traverse parks (principally in Tilden Regional Park); travelers using Grizzly Peak Boulevard, Claremont Avenue, Skyline Boulevard, and a few residential roads; and residents neighboring the parks. Due to the hilly terrain and vegetation cover, the project viewshed is generally limited to a foreground view distance (about 0.25 mile or less) from trails, roads, and residences to project sites. Some project sites are located in valleys with heavily vegetated slopes on either side, which limits the viewing distance. Views from outside the park area looking in are generally limited by terrain, vegetation, and structures. Residential developments with a view of project areas are generally limited to those locations directly adjacent to the project sites. EBRPD lands proposed for vegetation management that are adjacent to residents with potential viewsheds include Claremont Canyon Regional Preserve, Leona Heights Regional Open Space, and parts of Tilden Regional Park.

As mentioned in Appendix K, visual sensitivity is a function of the type and number of viewers, the importance of the project area, surrounding land uses, and the presence or absence of significant geological, historical, or botanical features. The entire park area corridor is rated as Sensitivity Level 1 (highest sensitivity). The East Bay Regional Parks are heavily used recreational areas, which are adjacent to an important travel route, and residential areas exist where many of the residents would have a high level of concern for the scenic qualities of the area.

#### **4.6.3 Alternative 1: No Action**

Under the No Action Alternative, vegetation removal would not occur and the visual appearance of the parks would remain as it currently exists. This area would include areas with a high density of French broom and other areas where the existing vegetation has become overgrown with nonnative species. The risk of wildfire would remain. A wild fire would adversely affect views

from the parks and residential properties as a result of substantial vegetation destruction and tree loss. Soils could be exposed by a wildfire, and these exposed soils would increase erosion potential. In the event of an uncontrolled wildfire, the resulting smoke would cause temporary, adverse impacts to visual resources. The footprint of an area burned by a wildfire would remain visibly black at least until the next growing season.

#### **4.6.4 Alternative 2: Proposed Action**

Visual impacts are described generally below by activity. More detailed descriptions are provided for impacts to specific sites where necessary.

- **Hand Labor.** In sites where land labor is proposed to remove areas of French broom or brush, potential impacts to visual resources include temporary loss of vegetation in the understory. As fire-resistant native species, such as live oak, fill in, the area would have a more complex visual pattern and dimensional shape than the solid mass of broom or brush that currently exists. Live oaks have a more complex form and line than broom or brush, and the vegetation would have a more random spatial arrangement, resulting in a more variable and distinctive visual pattern. Several growing seasons may pass before the native species fill in.

Selective clearing of small eucalyptus trees and pines would result in minor to moderate changes in the existing visual character or quality of the landscape. In many locations the vegetation is currently very dense; with clearing, the volume or mass of the vegetation would decrease, creating more openings in the landcover.

- **Tree Removal and Mechanical Treatments.** Tree removal would cause the most dramatic visual changes. In some cases, tree removal would open viewer exposure to roadways and to more distant vistas. Generally, however, viewed from the roadways, residential areas, and trails, areas of tree removal would still retain an overall green color, provide a continuous vegetative cover, and maintain visual continuity. The scale of the vegetation may be slightly reduced in some areas. In several places a vegetative barrier exists between a project area and sensitive viewing locations, and this visual screen would be maintained. In others, the viewshed across parklands would be opened up, expanding the vista.

In several locations in Tilden Regional Park, removal of mature trees along roadways is planned. At Sites 101 and 102, eucalyptus trees would be thinned or removed in an area that is a principal entrance to the park. The pony stable and adjacent canyon may become more visible from the road. Some mature native trees that are intermixed in the eucalyptus stands would help maintain the existing view from the road. At Site 103, Monterey pines constitute the greatest percentage of mature trees; however, they are intermixed with redwoods and bays. Site 104 would be most impacted by the removal of the Monterey pines and eucalyptus trees adjacent to the golf course. Although a substantial amount of vegetation exists, Monterey pines and eucalyptus trees constitute most of the large trees in the area. In all of these areas, a continuous vegetative cover would continue to exist, but the scale of the vegetation may be slightly reduced.

At Site 502 in Redwood Regional Park, the thinning or removal of pines, acacias, and selected cypresses would open up the area for native grassland and lend greater views of the

serpentine prairie from the roadway. Again, a continuous vegetative cover would continue to exist, but the scale of the vegetation may be slightly reduced.

- **Prescribed Fires.** Under the Proposed Action Alternative, prescribed fires would have temporary visual impacts that would be similar to the impacts resulting from a naturally occurring wildfire, as described in the No Action Alternative. Impacts from a prescribed fire would be less in magnitude and duration compared to impacts from a wildfire because of the smaller areas burned and the lower intensity of the burn. Because the prescribed fires would be conducted in a controlled manner, EBRPD would reduce the impacts to visual resources by monitoring meteorological conditions and planning the burns to coincide with weather conditions conducive to dispersal of fire-induced smoke.

Prescribed fires are proposed at seven sites, and broadcast burning of slash piles is proposed for one site. At Site 251, a vegetative buffer would be maintained between the roadway and the prescribed burn site. At Sites 251 and 252, the area of the prescribed fire would be divided into sections and the prescribed fire would be performed over a 3-year period, which would reduce the associated visual impacts. At Site 252, the temporary impacts of the prescribed fire would be visible from nearby residences. At Site 351, the temporary impacts resulting from the prescribed fire would be visible to visitors of Sibley Volcanic Regional Preserve. The temporary impacts resulting from the prescribed fire would be visible to nearby residents and visitors to Redwood Regional Park at Sites 551 and 552. The temporary visual impacts would result from the broadcast burn of eucalyptus slash at Anthony Chabot Regional Park. The area is adjacent to residences and a golf course. The residences and golf course are on the lower side of the ridge, and it is expected that the burn area would be visible in a few locations. The Sugar Loaf area at Site 751 at Leona Heights Regional Open Space is surrounded by residences and is near to Merritt College; hence, temporary adverse visual impacts would result from the prescribed burn.

- **Grazing.** Potential visual impacts from the introduction of livestock grazing include changes in the vegetative makeup of the landscape. Livestock are capable of maintaining open grasslands and minimizing brush and tree encroachment. Site 603 in Anthony Chabot Regional Park is proposed for livestock grazing. Residences are located on the ridgeline looking over the project site. The site consists of shrub and brush-covered canyons and valleys, so the change in vegetative makeup would not be dramatic. The visual character of the site would also be altered by the addition of livestock and livestock fencing (5-strand barbed wire) in the designated areas.
- **Chemical Treatments.** Garlon 4 is an amber liquid. The application of Garlon 4 would be conducted by hand. All applicators would receive training on how to minimize exposure to nontarget vegetation and personal exposure. Garlon 4 would be spot-applied only when little or no risk of spray drift from excessive wind velocities exists. Garlon 4 is toxic to aquatic organisms, plants, and invertebrates and would not be applied to wetlands, ponds, lakes, streams, creeks, rivers, or wildlife habitat at the edge of water bodies (refer to Appendix I for complete label and MSDS information for Garlon 4 and a pre-mixed solution of Garlon: Pathfinder™ II). Beneficial impacts of this herbicide application to eucalyptus tree stumps and re-sprouts include the prevention of reestablishment of nonnative eucalyptus stands. Eucalyptus often shades and out-competes native vegetation.

- **Mitigation Measures.** The implementation of mitigation measures would reduce or minimize the visual contrasts and impacts of the proposed project. Vegetation that is not to be removed would be protected from damage caused by clearing activities. A supervisor who understands the sensitivity of the clearing activities and who provides daily instruction and supervision to crews would be employed to direct crews.

#### **4.6.5 Alternative 3: Modified Methods**

The impacts associated with Alternative 3 would be similar to those of the Proposed Action Alternative. Goats would be used at Site 308 in Sibley Volcanic Regional Preserve instead of using hand labor to cut brush and pile it for burning. This activity would impact the visual character of the area for a longer period. At Site 603 in Anthony Chabot Regional Park, goats would be grazed instead of installing a fence and extending the area grazed by cattle. Because of the lack of fencing, this activity would have less visual impact than livestock grazing. Goats would also be used to graze Site 701, which would impact visual resources for a longer period than would hand labor. At Site 252 at Claremont Canyon Regional Preserve, hand labor would be used instead of prescribed burns. This activity would have less visual impact than the burn.

### **4.7 SOCIOECONOMICS AND SAFETY**

The project areas span Alameda and Contra Costa Counties. Alameda County has approximately 1,443,741 residents (U.S. Bureau of the Census 2000). Contra Costa County has approximately 948,816 residents (U.S. Bureau of the Census 2000). The unemployment rate for Alameda County as of June 2000 is 3.3 percent; Contra Costa County's unemployment rate is 3.0 percent (Employment Development Department 2000). Approximately 19 percent of Alameda County's population is of Hispanic origin, and 51 percent identified themselves as nonwhite (U.S. Bureau of the Census 2000). Approximately 18 percent of Contra Costa County's population is of Hispanic origin, and 34.5 percent identified themselves as nonwhite (U.S. Bureau of the Census 2000).

The project sites are within the bounds of recreational parklands; adjacent lands are principally residential and open space. Land uses in the project vicinity include several small retail businesses, LBNL, Claremont Resort and Spa, UC Berkeley Clark Kerr residential campus, and Merritt College.

#### **4.7.1 Executive Order 12898: Environmental Justice**

On February 11, 1994, President Clinton signed EO 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This EO directs each federal agency "to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations in the United States." EO 12898 also tasks federal agencies with ensuring that public notifications regarding environmental issues are concise, understandable, and readily accessible.

Socioeconomic and demographic data for residents in the project vicinity were studied to determine if a disproportionate number (defined as greater than 50 percent) of minority or low-income persons have the potential to be affected by the alternatives.

A comparison of relevant environmental justice indicators for these three groups is shown in Table 5. Review of these indicators was based on census tract information for the immediately affected areas (ten census tracts), adjacent potentially affected areas (six census tracts), and averages for Alameda and Contra Costa Counties. The socioeconomic indicators for 13 of the census tracts reviewed were consistently homogenous. Indicators for three of the census tracts were inconsistent with the majority and are listed separately by census tract number.

With the exception of three census tracts, the proposed project and neighboring areas do not have a majority of low-income persons, minorities, persons with limited formal education, or persons with limited English-speaking ability. The percentages of minorities, persons with limited formal education, and persons with limited English-speaking ability are generally less in the project area than for Alameda and Contra Costa Counties as a whole. However, three of the census tracts within the project vicinity have indicators that demonstrate a greater than 50 percent minority population.

**Table 5  
Comparison of Environmental Justice Indicators**

Indicator	Alameda County	Contra Costa County	Greater than 50 percent Nonwhite Persons (Census Tract)		
			4081	4099	4100
Nonwhite Persons	51%	34.5%	58%	72%	62%
Persons of Hispanic Origin	19%	18%	4%	3%	3%
Persons Over Age 5 who Speak English "Less Than Very Well"	17.7%	11.5%	1%	1%	1%
Persons Over Age 25 who have Less than 9th Grade Education	8%	5.2%	1%	0%	5%
Persons in Households with Public Assistance Income	4.2%	2.8%	1%	1%	2%
Persons with Income Below Poverty Level	11%	7.6%	3%	5%	4%

Source: U.S. Bureau of the Census 2000

**4.7.1.1 Alternative 1: No Action**

Under the No Action Alternative, vegetation removal would not occur, and the potential for wildfire would remain. Because no federal activity would occur, no requirement for compliance with EO 12898 exists.

**4.7.1.2 Alternative 2: Proposed Action**

As described above, most of the project vicinity does not have a disproportionate number of minority persons, low-income persons, persons with few years of formal education, or persons with limited English-speaking ability. Three of the census tracts within the project vicinity demonstrate a greater than 50 percent minority population. However, most impacts from the Proposed Action Alternative would be beneficial. Reduction of fire hazard would minimize the potential damage to businesses and homes in the event of a fire. The implementation of the proposed project would provide a limited number of job opportunities to the community through the use of local logging contractors. No roads would be closed during project activities; therefore, local businesses, and residents would not be adversely affected. Any adverse impacts would be temporary. Measures would be taken to ensure the safety of the community during the implementation of the proposed project (as discussed in Section 4.7.3).

**4.7.1.3 Alternative 3: Modified Methods**

Under Alternative 3, impacts to socioeconomics would be similar to those described under the Proposed Action Alternative.

**4.7.2 Property Values**

In 2002, the median home value in Alameda County was \$482,000. In Contra Costa County, the 2002 median home value was \$337,000. In the project vicinity the Berkeley median home value is \$554,250, the Orinda median home value is \$720,000, and the Oakland median home value is \$360,000 (California Association of Realtors 2002).

**4.7.2.1 Alternative 1: No Action**

Under the No Action Alternative, vegetation removal would not occur, and the potential for a catastrophic wildfire would remain high.

**4.7.2.2 Alternative 2: Proposed Action**

Implementation of the proposed project would result in a decreased risk of a catastrophic wildfire. Any impacts due to vegetation management activities would be temporary and would not affect property values, with the exception of cattle-grazing activities in Anthony Chabot Regional Park. Although grazing activities could slightly alter the character of the viewshed, it is not expected to result in negative impacts to property values.

**4.7.2.3 Alternative 3: Modified Methods**

Under Alternative 3, impacts to property values would be similar to those described under the Proposed Action Alternative.

**4.7.3 Public Safety**

The East Bay Regional Parks are a highly utilized resource in the San Francisco Bay Area. EBRPD maintains its own police force and fire services division. The authority to police the lands comes from the State Public Resources Code (Section 5561), which confers on EBRPD all the powers found in municipal police departments. The EBRPD Department of Public Safety has an authorized patrol strength of 54 sworn officers, supplemented with seasonal officers and a reserve officer program. The department's vehicle patrol includes car, motorcycle (street and off-road), horse, boat, and helicopter patrols. The department has its own detective unit for crime investigation, and a modern dispatch center located at department headquarters.

The EBRPD Fire Services Division has a staff of 11 full-time permanent and 6 full-time seasonal firefighters. The division also employs 40 industrial volunteers consisting of on-call EBRPD staff who have been trained in fire-fighting techniques. The division maintains 13 fire-fighting vehicles and two helicopters. The division works directly with CDF, which has primary responsibility for all unincorporated areas in the project vicinity. EBRPD also has mutual aid agreements with the cities it borders. The division's responsibilities include fire prevention through vegetation management and prescribed fires and on-call fire-fighting in the event of wildfires or arson.

**4.7.3.1 Alternative 1: No Action**

Under the No Action Alternative, vegetation removal would not occur, and the potential for wildfire would remain and continue to threaten the lives and safety of the public. In the event of an uncontrolled wildfire, the safety of people in the vicinity would be threatened.

**4.7.3.2 Alternative 2: Proposed Action**

Public safety in the Hills would likely be improved by the removal of highly flammable vegetation. The resulting reduction in fire hazard would decrease the potential damage to businesses and homes in the event of a fire.

In addition to promoting fire prevention, the removal of large trees in the project area could provide benefits to public safety. In the event of high winds, wind throw could cause breakage of branches or topple entire trees. The removal of large trees can reduce the potential damage associated with wind throw. The U.S. Geological Survey reports that the overall probability of an earthquake of magnitude greater than or equal to 6.7 on the Hayward–Rodgers Creek Fault system before the year 2030 is 32 percent (Association of Bay Area Governments 2000). The proposed project would provide benefits by removing fuels near residences and roadways and thereby reduce the potential impacts from fire caused by gas line breakage during an earthquake. The proposed project would decrease the potential for erosion and landslides by reducing residual impacts associated with a catastrophic, stand-replacing wildfire (refer to Section 4.2.5). To protect the safety of the community around the project area, the following measures would occur under the Proposed Action Alternative:

- The work areas and other public hazards would be barricaded and properly marked.
- Trucks traveling through the area would maintain legal and safe speeds.

- Noise associated with clearing and planting activities would be kept within legal limits for residential areas.
- In performing prescribed fires or burning slash piles in conjunction with the proposed project, EBRPD would comply with BAAQMD, CDF, and California Air Resources Board requirements regarding permitting and public notification prior to initiating burns.
- Prescribed fires would be conducted according to EBRPD’s “Prescribed Fire Plan Development Guideline.”
- Prescribed fires would be conducted in a controlled manner and the impacts to air quality would be reduced by monitoring meteorological conditions and planning the prescribed fires to coincide with weather conditions conducive to dispersal of fire-induced smoke.
- Additional fire jurisdictions would be available as backup in some situations.
- Garlon 4 would be used according to the prescribed indications for the product.

#### **4.7.3.3 Alternative 3: Modified Methods**

Under Alternative 3, impacts to public safety would be similar to those described under the Proposed Action Alternative.

### **4.8 PUBLIC SERVICES**

EBRPD lands are publicly owned open space set aside for the use and enjoyment of the general public. As such, they provide a unique public service for the residents of neighboring communities. Recreational opportunities, including hiking, bicycling, swimming, fishing, boating, horseback riding, golfing, camping, picnicking, nature study, wildlife viewing, and various children’s programs are services provided by EBRPD. EBRPD maintains its own fire department, which participates in vegetation management programs and responds to wildfires on EBRPD lands. Other emergency services (police, medical, and fire) are provided to EBRPD lands through the local 911 program.

#### **4.8.1 Alternative 1: No Action**

Under the No Action Alternative, no vegetation management activities would occur. Therefore, public services would not be affected. In the event of a future wildfire, parklands and public roads may be closed to recreational users for safety purposes or to allow for regrowth of vegetation and habitat. Recreational opportunities, such as hiking or wildlife viewing, could be diminished for years after a wildfire.

#### **4.8.2 Alternative 2: Proposed Action**

None of the parks would be closed during implementation of the proposed project; however, park visitors would be temporarily excluded from using some areas of the parks. During implementation of the proposed project, affected areas of the park would be safeguarded using

appropriate signage, temporary fencing, and/or flagging crews. EBRPD would post notices well in advance of temporary closures so that park users could make alternate plans. The EBRPD fire division would be responsible for implementing prescribed fires. In addition, local fire districts and/or CDF would be notified as appropriate.

Logging activities would be conducted by a licensed, professional tree service, and herbicide application would be conducted by licensed contractors or authorized, licensed staff. Hand-clearing activities could be conducted by a variety of organizations, including public agencies, private firms, volunteers, or subsidized labor forces such as the East Bay Conservation Corps, the California Conservation Corps, and/or the California Youth Authority.

#### **4.8.3 Alternative 3: Modified Methods**

Under Alternative 3, impacts to public services would be similar to those described under the Proposed Action Alternative. However, because sucker bashing would be conducted three times per year, these nine sites would be closed to the public more often than under the Proposed Action Alternative.

### **4.9 CUMULATIVE IMPACTS**

Cumulative impacts are defined as environmental effects which result from the combination of a proposed project with other past, present, and reasonably foreseeable future actions, regardless of the party responsible for each action. Projects in the recent past, currently on-going, or proposed in the project vicinity were reviewed for their potential to produce cumulative impacts when conducted in conjunction with the Proposed Action Alternative (Alternative 2).

As mentioned in Section 2, the HEF was established to coordinate large agency fire hazard reduction efforts. The HEF itself undertakes no specific fire reduction actions; actions are taken by individual agencies, each of which is responsible for complying with applicable local, state, and federal environmental regulations. HEF members have recently implemented, are currently undertaking, or propose to execute a number of fire hazard reduction programs, including the following:

- The cities of Oakland, Berkeley, and El Cerrito regularly conduct inspections of public and private property to ensure that distances between structures and vegetation comply with local fire safety codes.
- EBRPD and EBMUD annually control the re-introduction of eucalyptus by treating eucalyptus stumps on their properties.
- The City of Oakland regularly uses goat grazing to manage grasslands on a number of city properties bordering residential areas in the Hills.
- EBMUD manages a ridgetop fuelbreak along its property at the top of Claremont Canyon.
- LBNL and UC Berkeley undertake a variety of fire hazard reduction and vegetation management projects around structures on their properties.

- EBRPD began its fuelbreak program in 1974 and has continuously managed a 15-mile-long fuelbreak along the west boundary of its chain of parks from Lake Chabot to Tilden Regional Park.

Similar to HEF member municipalities, the City of Richmond implements inspection and abatement programs to enforce local fire safety codes.

EBRPD chose the projects included in the Proposed Action Alternative (Alternative 2) to have a minimum impact on park resources and visitors. Cumulative impacts have been considered for three key aspects of the proposed projects: use of prescribed fire, removal of exotic plant species, and other vegetation management activities.

The use of prescribed fire in the Hills to manage vegetation would be a near-natural process. Prescribed fire would be used to create a more open brushland/grassland mosaic within a 120-acre area of Claremont Canyon Regional Preserve, a 70-acre area in Redwood Regional Park, and a 60-acre area in Leona Heights Regional Open Space. In all three cases, hand thinning would be used to create a brushland/grassland mosaic of a few acres within each project area that can then be safely burned on a rotating cycle.

The removal of exotic plant species that are extremely flammable and that displace more fire-safe native vegetation would proceed as follows:

- French broom has invaded several ridgetop areas of EBRPD lands. Hand removal of French broom is proposed at 35 acres in Tilden Regional Park and 0.4 acre in Claremont Canyon Regional Preserve.
- Mature eucalyptus trees and Monterey pines are to be removed from 1.8 acres in Tilden Regional Park, 3.5 acres in Sibley Volcanic Regional Preserve, 0.1 acre in Huckleberry Regional Preserve, and 0.2 acre in Redwood Regional Park. In addition, red gum eucalyptus trees would be removed at the east end of several existing fuel breaks in Anthony Chabot Regional Park. The HEF study area currently contains a total of 1,087 acres of mature eucalyptus trees. The proposed removal of mature eucalyptus trees and Monterey pines from 5.6 acres of EBRPD parks would therefore impact 0.5 percent of this vegetation type in the Hills.
- Second-growth eucalyptus trees would be removed from 32.5 acres in Tilden Regional Park, 22.7 acres in Sibley Volcanic Regional Preserve, 0.2 acre in Huckleberry Regional Preserve, and 0.2 acre in Redwood Regional Park. The HEF study area currently contains a total of 1,565 acres of second-growth eucalyptus trees. The proposed removal of second-growth eucalyptus trees from 55.6 acres of EBRPD parks would therefore impact less than 4 percent of this vegetation type in the Hills.

Other proposed vegetation management activities include:

- Management of the eucalyptus tree understory under the large grove at Stonewall at the west end of Claremont Canyon Regional Preserve
- Fencing of 80 acres of brushland in a fire-chimney below residences at Parkridge Gate and extending the existing Grass Valley grazing program at Anthony Chabot Regional Park

- Removal of brush on 20 acres along the south residential interface in Leona Heights Regional Open Space, and managing this area as a new fuel break.

The HEF study area has a total of 18,481 acres of wildlands that include private, public agency, and regional parklands. In total, the proposed EBRPD vegetation management projects involve work on 606.8 acres, or 3 percent of the total wildlands in the Hills.

The cumulative impacts associated with the implementation of the proposed projects within the time frame of the Proposed Action Alternative (Alternative 2) would include impacts to biological resources, increased visual resource sensitivity, increased soil erosion from exposed surfaces, and increased sedimentation of area waterways. However, there would be no significant cumulative impacts from the individual EBRPD actions when considered together under the Proposed Action Alternative because of their disparate locations, the limited scope of the work, and the proposed mitigation. Nor are there other actions by EBRPD at these locations that would have any significant cumulative impacts with the vegetation management projects. The actions of the other HEF members occur on separate lands from the sites of the EBRPD actions to be funded under the Proposed Action Alternative. Therefore, there are no cumulative impacts from overlapping work on the same lands. In addition, the other HEF actions are sufficiently distant from the EBRPD actions in location or time that there would be no significant cumulative impacts on common resources, such as wildlife habitat. Finally, the totality of the EBRPD's vegetation management projects and the other HEF actions would not have any significant cumulative impacts through the loss of any sensitive species or habitat.

FEMA is the lead federal agency for conducting the NEPA compliance process for EBRPD's vegetation management project. As the lead agency, FEMA expedites the preparation and review of NEPA documents, responds to the needs of residents surrounding EBRPD lands, meets the spirit and intent of NEPA, and complies with all NEPA provisions.

The Draft Environmental Assessment was made available for public review on October 21, 2002. The public comment period lasted 30 days, ending on November 20, 2002. A public meeting was held at the EBRPD headquarters on November 12, 2002. The Notice of Availability of the Draft Environmental Assessment and a list of the interested parties who were notified is provided in Appendix L.

FEMA reviewed all written comments submitted and comments offered at the public meeting and incorporated them into the Final EA, as appropriate. Appendix M provides the notes from the public meeting, all written comments received, and a table summarizing the issues raised in the public comments.

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## **Figures**

**Appendix A**  
**Description of the Disaster**  
**(Excerpt from**  
***Hazard Mitigation Report for the East Bay Fire in the Oakland-Berkeley Hills***  
**(FEMA et al. 1992))**

**Appendix B**  
**Wildland Hazards and Mitigation Programs**  
**(Excerpt from**  
***Fire Hazard Mitigation Program and Fuel Management Plan for the East Bay Hills***  
**(Amphion Environmental 1995))**

**Appendix C**  
**Treatment Prescription Descriptions by Vegetation Type**

**Appendix D**  
**Prescribed Fire Plan Development Guidelines**

**Appendix E**  
**U.S. Fish and Wildlife Service**  
**Biological Opinion**

**Appendix F**  
**Special-Status Species That Potentially Occur in the**  
**Project Areas or Project Vicinity**

**Appendix G**  
**Agreement with U.S. Fish and Wildlife Service Terms and Conditions**  
**By East Bay Regional Park District**

**Appendix H**  
**Background Research on Prescribed Fire**

## **H1.0 NORTH COASTAL SCRUB**

In north coastal scrub habitats, prescribed fire has been used as a tool for re-introducing fire into a fire-suppressed ecosystem to reduce loads and mimic the positive effects of natural fires. Under ideal environmental conditions, a prescribed fire reduces fuel loads and unlocks and recycles nutrients in live and dead woody debris and litter (Morgan, Neuenschwander, and Swetnam 2001). Heat from fire increases the weathering of soil and helps to release minerals into the ecosystem (Kutiel and Shaviv 1989). For some species, burned organic matter provides a chemical (nitrogen oxide) cue for their dormant seeds to begin germinating (USGS 2001a). Some species in plant communities such as north coastal scrub require heat to crack open seed coats and initiate germination (Brown and Smith 2000). In addition, some shrubs in these vegetation communities re-sprout following a fire and/or seedlings become better established in the post-fire mineral soil. However, the season of a fire can affect how the seeds respond. An off-season (wet) fire is not a natural occurrence in chaparral/scrub communities. Damp seeds in the topsoil layer are more sensitive to the heat generated from fires during these months. Instead of beginning their germination process, moist seeds exposed to fire will usually perish (Parker 1986). This can increase opportunities for off-site nonnative seeds to become established as a result of the reduced competition from on-site chaparral/scrub seed banks.

Under natural fire regimes, chaparral and scrub communities typically burn during the dry season. The leaves of many of the plants contain flammable substances such as oils, fats, resins, alcohols, and unsaturated hydrocarbons that encourage fire. Under certain fire intervals, the post-fire vegetation community is another chaparral/scrub mosaic; fire regenerates and maintains the original community type. This is in part a result of nitrogen-fixing bacteria in the roots of these plants. This physiological adaptation enables shrubs to grow in a recently burned area without needing nitrogen bacteria to regenerate the soil and make it difficult for other types of vegetation to become established (Cohen 1998). Under longer fire intervals, the exclusion of fire from the communities facilitates succession to another community type (Biswell 1989). With fire exclusion, succession from a North Coastal Scrub community to a Mixed Hardwood Forest community can occur in approximately 50 years (USDA 2003). On the other hand, frequent low-intensity prescribed fires can be used to convert scrub and chaparral communities to Grasslands communities. Increasing the fire frequency to an interval of less than 5 years or overgrazing in scrub communities may convert this vegetation community to a nonnative annual grassland (Keeley 2002; Stephenson and Calcarone 1999).

Coyote bush is a predominant species in the North Coastal Scrub community in the proposed project areas that has expanded into grasslands and in some areas forms dense canopies. One study in EBRPD properties (Tilden Regional Park, Sibley Volcanic Regional Preserve, Redwood Regional Park, and Grass Valley) found that coyote bush had been invading the grasslands since these parks were established in 1934 (McBride and Heady 1968). The invasion of coyote bush in grasslands in the parks was attributed to fire suppression and lack of grazing. Experimental plot data indicated that grazing and livestock trampling reduced coyote bush cover. In addition, conducting a prescribed fire that was hot enough at the root crown of coyote bush effectively killed it. However, coyote bush is moderately fire tolerant and has the ability to re-sprout and reproduce by seed following low-intensity fires.

## **H2.0 GRASSLANDS**

In the Grasslands community, frequent low-intensity fires effectively reduce fuel loads and prevent shrub establishment. Prescribed fires in annual nonnative grasslands also have the potential to increase cover of native annuals and perennials. Warm season burns (late-spring and fall) in a California annual grasslands in Carrizo Plain Natural Area increased the cover and diversity of native vegetation and decreased the cover and seed viability of exotic nonnative grasses relative to the control plot (Meyer and Schiffman 1999). Winter burning did not increase native plant cover and moderately decreased exotic plant cover. These results indicate that burning during the warm season was beneficial to native plants and detrimental to nonnative plants because of the different seasons that these plants are vulnerable to the negative effects of fire, season-specific fire intensity, and potentially the removal of mulch. Another study found that late spring burning in California annual grasslands increased the cover of native perennial grasses by reducing competition with nonnative annual grasses; during late spring nonnative annual grass seeds are vulnerable to fire (Menke 1992).

Most native perennials are adapted to fire cycles and after a fire they easily re-sprout or require fire to germinate. Native perennial grasses are less of a fire hazard than nonnative annual grasses because they dry out later in the season and have a shorter period of potential ignition. Burns after approximately July 1 (after native perennial grasses set seed and most birds are no longer nesting) encourage the germination of native grasses and prevent the disruption of breeding birds. Prescribed fires during any season, especially during the winter, create disturbances that can result in increased soil erosion and an increased cover of aggressive, nonnative plants.

## **H3.0 WILDLIFE**

Over the past century, urban fire exclusion policies have negatively affected wildlife habitat elements and allowed fuel loads to accumulate to unhealthy, perilous levels. The lack of natural, localized fire in the Hills has resulted in the encroachment of invasive, nonnative plant species such as star thistle and pampas grass that do little to facilitate wildlife vigor. Fire suppression has also promoted decadent, intertwined growth of native shrub canopy layers. This has created dense, impenetrable vegetation that prohibits large mammals such as the black-tailed deer from either browsing new shrub growth for nourishment or traveling through segments of habitat for escape or cover from predation.

According to Biswell (1989), the use of prescription fire creates a mosaic of vegetation communities at various successional stages and enhances existing wildlife habitat. Biswell writes that small burns of variable intensity improve habitat by creating openings that benefit wildlife movement corridors. Prescription fires also improve the nutritious quality of available forage (USGS 2001b). Most wildlife adapted to fire-influenced landscapes will survive low-intensity prescription fires (Handley 1969) and in some cases are attracted to newly burned areas (Klebenow and Beall 1978).

## **H4.0 SPECIAL-STATUS SPECIES**

A transition of nonnative eucalyptus trees, acacia, Monterey pines, and French broom to a mosaic of native habitats of varying age classes and structure is expected to directly benefit Alameda

## Appendix H

### Background Research on Prescribed Fire

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whipsnake populations by increasing both the heterogeneity of the habitat and the available acreage for the Alameda whipsnake (Swaim 2002). Although Alameda whipsnakes are typically found in shrub communities (e.g., North Coastal Scrub), telemetry data have revealed that whipsnakes also venture into adjacent habitat types, including grasslands, oak savannas, and occasionally oak-bay woodlands (Swaim 1994).

Presidio clarkia, Santa Cruz tarplant, and pallid manzanita could potentially benefit from a properly planned fire because these species are threatened by fire suppression. One potential benefit of prescribed fire for all three of these species is the temporary reduction of exotic, competitive species, such as annual grasses and/or mature French broom (Nature Conservancy 2000). Pallid manzanita is also threatened by shading and competition with aggressive nonnative plants, including eucalyptus trees, Monterey pines, cypresses, and French broom. Presidio clarkia at Redwood Regional Park is also threatened by competition with nonnative plants, including annual grasses and French broom (Appendix E). Competition with aggressive nonnative plants and elimination of periodic fire are two of the four major factors that threaten Santa Cruz tarplant. Unseasonable fire is another threat to small populations of this species (Appendix E).

Fire also plays a role for non-burl-forming manzanitas, such as pallid manzanita, in facilitating its reproduction by seed. Fire recycles limited soil nutrients and removes the leaves, bark, fruit, and roots of manzanitas, all of which inhibit seed germination (Amme and Havlik 1987). In the absence of fire, pallid manzanita can decline and be displaced by a bay laurel–Pacific madrone community. For example, fire within the last 20 to 30 years at Sobrante Ridge is associated a healthier population of pallid manzanita compared to other populations where fires have not occurred for approximately 70 to 100 years (Appendix E).

## **Appendix I**

### **Specific Use Guidelines, Label, and MSDS for Garlon 4 and Pathfinder II Herbicides in East Bay Regional Park District Fuel Management Zones**

**Appendix J**  
**Response Letter from the State Historic Preservation Officer**

**Appendix K**  
**Visual Resource Analysis**

## **1.0 TERMS AND METHODOLOGY**

A visual assessment was performed to identify, describe, and map visual resources that may be affected by the alternatives. Baseline data were recorded in sufficient detail to allow assessment of direct and indirect impacts of the alternatives. The visual resource study was conducted using methodologies developed by both the U.S. Forest Service (1974) and the Federal Highway Administration (No Date).

Visual assessment requires the use of terms and concepts that are unfamiliar to many agency personnel and members of the public. A brief description of the methodologies, terms, and concepts is presented below to help the reader understand and evaluate the visual environment of the project area and the assessment of potential effects.

### **1.1 Visual Character and Quality**

To assess the potential effects a project may have on scenic resources, it is first necessary to describe the visual environment of the project area. The scenic qualities of a landscape are determined through an analysis of the landscape character type. Landscape character type is a unit of physiographic area having common landscape features of landforms, rock formations, water form, and vegetative patterns.

Landscape features can be broken down into four factors: form, line, color, and texture. The form of an object is its visual shape or mass. Lines are often defined by edges of objects, landforms, or vegetation. Color is defined by both the value or reflective brightness (light, dark) and its hue (red, green). Texture is apparent surface coarseness.

The degrees of diversity in a landscape are called variety classes and are a measure of the scenic quality of a landscape. Three variety classes have been established:

- **Variety Class A - Distinctive:** areas where features of landform, vegetative patterns, water features, and rock forms are of unusual or outstanding visual quality. These areas are not common within the project area.
- **Variety Class B - Common:** areas where features contain variety in form, line, color, or texture or combinations thereof, but which tend to be common throughout the character type and are not outstanding in visual quality.
- **Variety Class C - Minimal:** areas where features in the landscape have little change in form, line, color or texture. Includes all areas not found under Classes A or B.

Visual relationships between elements in a landscape can often be traced to four factors: dominance, scale, diversity, and continuity. Specific elements or components in a landscape may dominate the view because of position within the landscape, contrast, or importance. Scale is the apparent size relationship between landscape components. Diversity is a function of the number, variety, and intermixing of visual patterns. Continuity is the uninterrupted flow of patterns in a landscape and the maintenance of the visual relationships of connected or related landscape patterns.

Other evaluative criteria of the quality of a landscape include three perceptual factors: vividness, intactness, and unity. Vividness is the visual power or memorability of a landscape scene, for instance, the view of the Golden Gate Bridge in San Francisco or Mount Shasta in Northern California. Intactness is the visual integrity of the natural and human-made landscape and its freedom from visual encroachments, for instance, a well-kept pastoral landscape. Unity is the visual coherence and compositional harmony of the landscape considered as a whole, often the result of carefully designed individual components within a landscape.

## **1.2 Description of Viewshed and Sensitivity**

A viewshed is the surface area visible from a viewpoint or series of viewpoints. It is that portion of the landscape that would be potentially visually impacted by project activities. Often, the potential effects of a project are assessed from selected viewpoints within a viewshed to describe the visual change or contrasts that would result from the project. Viewpoints may be selected due to the sensitivity of a location or because they present a view that is representative of the landscape.

Visual sensitivity is a measure of people's concern for scenic quality. It is a function of the type and number of viewers, activities of viewers, visual exposure of the project, and distance of the project from sensitive viewing locations. Three sensitivity levels are defined by the U.S. Forest Service:

- **Sensitivity Level 1 - Highest Sensitivity:** includes lands seen from primary travel routes where a significant number of viewers have major concerns for scenic qualities; primary recreation areas; scenic byways; views from residences; and areas of geological, botanical, or historical importance.
- **Sensitivity Level 2 - Average Sensitivity:** includes primary travel routes where a smaller volume of travelers have concerns for scenic qualities and/or the travel route or use area is of only local importance and has a low use volume.
- **Sensitivity Level 3 - Lowest Sensitivity:** includes all areas seen from travel routes and use areas where few users or travelers would have a concern for scenic quality.

## **2.0 PROJECT AREA**

### **2.1 Visual Character and Quality of Project Area**

The project area is within the California Coast Range Section of the Pacific Border Physiographic Province (Fenneman 1931). The project area includes 36 sites within the boundaries of seven parks of the East Bay Regional Park District located in Alameda and Contra Costa Counties. The parks are situated in the hills and run (from north to south) along the San Pablo Ridge, the Berkeley Hills, and the San Leandro Hills. The project area elevations range from 440 feet in Leona Heights Regional Open Space to 1,900 feet in Tilden Regional Park. Views from the different parks include San Francisco Bay, located about approximately 5 miles to the west, San Pablo Bay to the northwest, the South Bay to the southwest, Mount Diablo to the southeast, the San Pablo Reservoir to the northeast and the San Leandro Reservoir to the south.

The landscape surrounding the project areas consists of mostly open space, including protected watersheds, to the east and suburban housing. Leona Heights Regional Open Space is adjacent to Merritt College to the north and bounded by suburban residences. Claremont Canyon Regional Preserve is bounded by the Claremont Resort and Spa to the south, the UC Clark Kerr campus to the west, and suburban houses, including the area rebuilt after the 1991 East Bay Hills fire. Lawrence Berkeley National Laboratory and facilities for the University of California, Berkeley, are within a half-mile of the project area.

The vegetation that currently exists within the project areas includes large stands of blue and red gum eucalyptus trees, Monterey pines, mixed oak/bay woodlands, redwood and riparian forest, mixed chaparral, north coastal scrub, successional scrub, exotic shrubs and perennials (including French broom and acacia), and a mix of grasses dominated by annual exotic grasses. Vegetation types that have been identified for thinning or removal include eucalyptus stands, Monterey pine, north coastal scrub, and areas dominated by French broom.

The visual quality within the project areas is generally Variety Class B, with some Variety Class A. The hilly landforms, the vegetation cover, and suburban development are common within the regional landscape. The vegetation creates a dense medium texture of landcover and provides a visual continuity or flow of pattern. The variety of vegetation types also results in an intermixing of visual form, color, and texture patterns. The area is a recreational park and has value as open space. However, much of the scenery of the project lacks vividness or memorability—the most frequent view is of nearby hillsides, valleys, roads and residences, and is relatively common and indistinct. Certain vista points offer more memorable views of San Francisco Bay and Mount Diablo. In some areas, including the southernmost portion of the project area in Anthony Chabot Regional Park, the scenery is negatively impacted by existing disturbances, including transmission lines.

## **2.2 Viewsheds and Sensitivity of Project Area**

Viewer groups generally include recreational users of East Bay Regional Parks, including hikers and equestrians, travelers utilizing roadways that traverse parks (principally in Tilden Regional Park), travelers using Grizzly Peak Road, Claremont Avenue, Skyline Boulevard, and a few residential roads, and residential land owners that live adjacent to the parks. Due to the hilly terrain and vegetation cover, the project viewshed is generally limited to a foreground view distance (about 0.25 mile or less) from trails, roads, and residences to project areas. Some project areas are located in valleys with heavily vegetated slopes on either side. These locations limit the viewing distance. Views from outside the park area looking in are generally limited by terrain, vegetation, and structures. Residential developments with a view of areas where vegetation removal would occur are generally limited to locations adjacent to the project area. Residential areas with a viewshed of the vegetation removal areas include residences near Claremont Canyon Regional Preserve, Leona Heights Regional Open Space, and parts of Tilden Regional Park.

Visual sensitivity is a function of the type and number of viewers, the importance of the project area, surrounding land uses, and the presence or absence of significant geological, historical, or botanical features. The entire park area corridor is rated as Sensitivity Level 1 (highest sensitivity). The East Bay Regional Parks are heavily used recreational areas, are adjacent to a

significant travel route, and residential areas exist where many of the residents would have a high level of concern for the scenic qualities of the area.

The following sections provide an analysis of the potential effects the alternatives would have on the scenic resources within the project area. The degree to which the alternatives would affect the scenic qualities of the landscape depends on the amount of visual contrast that is changed by the alternatives in relation to the existing landscape character. The amount of contrast or compatibility between an alternative and the existing landscape features is defined by an analysis of the potential change in the basic visual elements (line, form, color, and texture) and how the alternative would affect the dominance, scale, diversity, and continuity of the existing landscape features. The potential impacts of an alternative are determined by the compatibility of the visual characteristics of the alternative with the existing landscape characteristics and also the landscape's inherent capability to absorb these changes without noticeable effect.

### **2.3 Alternative 1: No Action**

Under the No Action Alternative, vegetation removal would not occur, and the visual appearance of the parks would remain as it currently exists. This would include areas with a high density of French broom, which is a significant fire danger, and areas where the existing vegetation has become overgrown with nonnative species. However the risk of wildfire would remain. A fire would adversely affect views from the parks and residential properties as a result of substantial vegetation destruction and tree loss. Soils could be exposed by a wildfire, and this exposure would increase erosion potential. In the event of an uncontrolled wildfire, the resulting smoke would cause temporary, adverse impacts to visual resources.

### **2.4 Alternative 2: Proposed Action**

A combination of vegetation management activities has been proposed to selectively remove flammable vegetation from 36 sites within park boundaries. Visual impacts are described generally below by activity; a more detailed description is provided for impacts to specific sites. Types of vegetation management that will be used at these sites include hand labor, tree removal and mechanical treatments, prescribed fires, grazing, and chemical treatments. Detailed descriptions of each of these methods of vegetation management, including equipment requirements, application methods, timing, and maintenance procedures, are provided in Appendix C.

### **2.5 Alternative 3: Modified Methods Alternative**

Because the treatment areas and target vegetation would remain the same as in Alternative 2, the resulting visual resource analysis for Alternative 3 would be identical to that of Alternative 2.

### **3.0 VISUAL IMPACTS BY VEGETATION MANAGEMENT ACTIVITY**

#### **3.1 Hand Labor**

Actions will be limited to small, slow-moving crews of laborers under supervision from EBRPD staff familiar with the area and wildlife concerns. Brush will be removed from the site, piled for later burns or to break down in place, or chipped on site. Potential impacts to visual resources include the temporary impacts due to loss of vegetation in the understory. As fire-resistant native species, such as live oak, fill in, the area would have a more complex visual pattern and dimensional shape than the solid mass of broom that currently exists. Live oaks have a more complex form and line than broom, and the vegetation would have a more random spatial arrangement, resulting in a more variable and distinctive visual pattern. There may be several growing seasons before the native species fill in the project areas.

Some hand labor involves selective clearing, which would include activities such as removing dead branches or plants, trimming up the lower branches on trees to prevent a ground fire from spreading into the upper canopies, and removal of middle-story plants such as French broom and acacia that can act as fire ladders. These activities would result in minor to moderate changes in the existing visual character or quality of the landscape. In many locations the vegetation is very dense; with clearing, the volume or mass of the vegetation would decrease, creating more openings in the landcover. The existing vegetation appears to be overgrown in places; selective clearing would produce a more orderly, coherent visual pattern, not unlike the results of pruning an overgrown landscape. In many cases changes in the density of vegetation due to the selective clearing would not be noticeable.

If fire-resistant native species do not fill in, it is likely that brush and French broom will again fill the area, requiring subsequent and repeated removal.

#### **3.2 Tree Removal and Mechanical Treatments**

Several methods may be used to remove trees, including cranes, conventional logging by professional tree service, or a “brontosaurus” or similar mechanical grinder that has minimum impact on the remaining native vegetation.

Tree removal would cause the most dramatic visual change. In some cases, tree removal will open viewer exposure to roadways and to more distant vistas. Viewsheds from the upper levels of the homes would likely not be substantially affected by the project. Viewed from the roadways, residential areas, and trails, areas of tree removal would still retain an overall green color and provide a continuous vegetative cover, thus maintaining visual continuity. The scale of the vegetation may be slightly reduced in some areas. Concerns focus on the potential change in viewer exposure from sensitive viewpoints, such as residential areas, roadways, and trails, to the affected area. In several places a vegetative barrier exists between a project area and sensitive viewing locations, and this visual screen will be maintained. In others, the viewshed across parklands may be opened up, expanding the vista. In many cases changes in the density of vegetation due to the selective clearing would not be a negative impact.

In several locations in Tilden Regional Park, the removal of mature trees along roadways is planned. At Sites 101 and 102, eucalyptus trees will be thinned or removed in an area that is a principal entrance to the park. The pony stable and adjacent canyon may be more visible from the road. There are some mature native trees intermixed in the eucalyptus stands. At Site 103, Monterrey pines constitute the greatest percentage of mature trees; however, they are intermixed with redwoods and bays. Site 104 would be most impacted by the removal of the Monterrey pines and Eucalyptus trees adjacent to the golf course. Although there is a substantial amount of vegetation, Monterrey pines and Eucalyptus trees constitute most of the large trees in the area. In all of these areas, a continuous vegetative cover would continue to exist, but the scale of the vegetation may be slightly reduced.

At Site 502 in Redwood Regional Park, the thinning or removal of pines, acacias, and selected cypresses would open up the area for native grassland and lend greater views of the serpentinite prairie from the roadway. Again, a continuous vegetative cover would continue to exist, but the scale of the vegetation may be slightly reduced.

Temporary visual impacts would result from efforts to protect special-status species and prevent erosion. To avoid incidental disturbance of federally protected plant species, all individuals in the vicinity of the proposed activities would be fenced off using highly visible, temporary construction fencing prior to the onset of tree removal. Fenced areas would be avoided in all stages of vegetation removal activities. In addition, BMPs would be implemented to minimize soil erosion. Although care will be taken to minimize impacts to the vegetation in surrounding areas, potential impacts to visual resources include the temporary loss of vegetation in the understory. It is expected that fire-resistant native species, such as live oak and bay would fill in over the course of several growing seasons. In many cases changes in the density of vegetation due to the selective clearing would not be noticeable.

### **3.3 Prescribed Fires**

Under the Proposed Action, prescribed fires would have temporary visual impacts similar to the impacts resulting from a naturally occurring wildfire. The impacts from a prescribed fire would be less in magnitude than the impacts from a natural fire because of the smaller areas burned. Because the prescribed fires would be conducted in a controlled manner, EBRPD would reduce the impacts to visual resources by monitoring meteorological conditions and planning the prescribed fires to coincide with weather conditions conducive to dispersal of fire-induced smoke. EBRPD will follow its “Prescribed Fire Plan Development Guidelines” to evaluate, document, and prepare plans for prescribed fire projects (Appendix D).

Temporary visual impacts will result from fencing around special-status species areas. To avoid burning or creating a control line over a federally protected plant, a 100-foot radius surrounding all individuals in the vicinity of the proposed activities would be fenced off using highly visible, temporary construction fencing. These areas would be avoided when constructing control lines and conducting prescribed fires. Other temporary visual impacts include erosion control mechanisms. Post-fire soil erosion would be minimized by implementing BMPs, such as installing weed-free hay bales or silt fences, to prevent excessive erosion and siltation from entering riparian areas. Also, the footprint of the burn area will be darker in color until the next growing season.

### **3.4 Grazing**

Potential visual impacts from the introduction of livestock grazing include changes in the vegetative makeup of the landscape. Livestock are capable of maintaining open grasslands and minimizing brush and tree encroachment. The areas planned for livestock grazing consist of shrub and brush-covered canyons and valleys, so the change in vegetative makeup would not be dramatic. The visual character of the area will be altered by the addition of livestock and livestock fencing (5-strand barbed wire) in the designated areas.

### **3.5 Chemical Treatments**

The application of Garlon 4 would be conducted by hand. Beneficial impacts of herbicide application to eucalyptus stumps and re-sprouts include the prevention of re-establishment of nonnative eucalyptus trees. Eucalyptus trees are highly flammable and often shades out native understory vegetation.

### **3.6 Mitigation Measures**

The implementation of mitigation measures would reduce or minimize visual contrasts and impacts of the proposed action. Vegetation that is not to be removed would be protected from damage caused by clearing activities. A supervisor who understands the sensitivity of the clearing activities and who provides daily instruction and supervision to crews would be employed to direct crews

**Appendix L**  
**List of Interested Parties**

**Appendix M**  
**Public Comments on Draft Environmental Assessment**